advanced alternatives to IBM3270 and ICL7502

for details contact PT7 Sales 061-437 5391

Simonsway, Manchester M22 5LA **FERRANTI**

NEWS IN BRIEF Potter sues **US** govt

LEGAL action is being taken by peripheral manufacturer Potter against the US government over the latter's use of tape drives that employ the 6,250 bpi Group Code R Recording technique patented by Potter in the early sixties. Under the US patent laws a company can, as an alternative to suing the government indemnifies itself in its contracts against having to pay royalties, so if Potter wins its action they will probably have to be paid to Potter by the unlicensed suppliers.

HP launch

AN impact matrix line printer with a speed of 400 lines per minute has been announced by Hewlett-Packard. The HP 2608A can produce both conventional characters or graphics under microprocessor control, and has a starting price of £5,600.

Employment study

THE Federal German Ministry of Research and Technology is to spend 1.3 DM million (£350,000) in a bid to answer the question "To what extent will rapidly advancing technology afect employment prospects in industry?" It has commissioned a study that will be conducted jointly by Mackintosh Consult-ants, and Prognos of Basie.

Regent savings

BY revising its marketing BM chip include, for example, arrangements for the Regent VDU range, Digico is now able to offer a full option version, with a complete range of editing for £1,050. This represents a saving of £300.

Latest: New ICL

now available

from Metra Lowndes-Ajax.

General Ledger Package

Already over three hundred organisations worldwide are enjoying

fremendous benefit from the General Ledger Package supplied by

In the United Kingdom alone some forty companies profit from its

use. They come from fields as diverse as manufacturing, banking

Find out more by clipping the coupon below or phoning Weir Larsen on 01-680 2400 now.

Now available in its latest form for ICL 1980 installations

Metra Lowndes-Ajax, 17 Lansdowne Rd., Croydon CR0 2BX. Tel: 01-680 2400

Metra

Lowndes-Aiax

An international systems.

Metra Consulting Group and Lowndes-Ajax Computer Service

Aiding rehabilitation of drug addicts

dict under a special rehabilitation pro- per cent success rate. gramme is IBM.

lifestyle under 24-hour supervision, is run by such as IBM can donate £155 towards the group founded in Arizona State Prison in 1966. Treatment includes the intake of large tion played an important part in helping quantities of minerals and vitamins to combat the painful effects of drug withdrawal symptoms, coupled with a regime of elaxing physical exercises and study prelods to re-establish the ex-addict's concen-

Supported entirely by charitable dona-The programme, which requires the addict to follow a carefully controlled diet and sponsorship scheme under which companies varconon, a worldwide drug rehabilitation opening phases of implementation of the tion played an important part in helping David Rowe, a 26-year-old ex-alcoholic to re-adjust to a normal lifestyle, after seven years of drug addiction, during which he was

unable to hold down a job. Today Rowe leads a normal life, after overcoming severe physical and mental

THE first company to donate a fixed sum towards individual treatment of a drug admonths, and so far Narconon claims an 83 hardship. He expressed appreciation of IBM's role in contributing to his new life.

The commercial sponsorship scheme proposed by the Caterham, Surrey based offices of Narconon, first came to the attention of one of IBM's employees at its Croydon branch. He recommended that the fixed sum of £155 be donated, and Rowe was immediately allocated residential treatment along with the eight other addicts currently undergoing the rehabilitation programme.

A spokeswoman for Narconon said that the group was constantly in need of financial support and the precedent set by IBM would, hopefully, be followed by other interested companies.

IBM 64K RAM manufacturer, take action against a user of equipment that employs its patent but has not been licensed. However, the US just a memory'

From a special US correspondent.

ENDING speculation about its activities surrounding the introduction of its own high capacity memory chips in the new 8100 and System 38 machines, IBM last week revealed that its 64K RAM, although bigger and slower than its rivals, is more than just a memory. About 30% of the IBM chip is taken up with performance optimising unctions not normally found in a memory chip, according to T. M. Liptak, president of IBM's general technical division.

Talking in Burlington, Vermont, last week. Liptak said the 64K RAM is the king of a new family of IBM memory devices that also includes a 32K and an 18K part. Both the size and performance of this device have been the subject of consid-

erable speculation Liptak quoted the typical access time of the 64K RAM as being 300 nanoseconds, while the chip area is around 62,000 square mils. The access time is more than twice that quoted by Texas Instruments for its own 64K RAM, and the size is about

double the TI part. But the extra functions in the an 8-bit register that is capable of a 100 nanosecond data rate, bi-directional input/output bus-sing and the ability to access data while the memory is being refreshed. The chip also con-

tains 2,500 bits of redundant This is only brought into play when functional testing of the chip reveals the addresses of

defective bits. When located, the "redundant" meniory section is programmed as a read onlywrite once memory, holding data on the defective bit addresses, so that only the good bits become chip addressable. Though the access time appears slow, IBM states that these added functions give an

Input station for Office

System 6 word processor

uproved data rate. The chips are mounted on metal/ceramic carrier modules which are joined together in groups of ten to form 11.4 x 17.8 cm memory cards holding 256K bytes of RAM.

A SIMPLE input station for the

Office System 6 word processor

has been announced by IBM

for the benefit of users with

large volumes of keyboard-

Designated the 6/420, it con-

sists of a keyboard, screen and

floppy disc drive. It allows discs

control

the 41 stations in the area to be more efficient in doploying men and equipment to fires.

nel by next year at the Greater Manchester County Fire Service control complex in Swin ton, the Forranti produced Computer-based Mobilising System being used here will aid

700G aystem, it will be res-

for buying another whole sys-

At the same time IBM has an-

nounced price reductions on its

existing System 6 models. These

reductions range from £3,167 on

the 6/430 disc-plus-cards unit to

The 6/420 will sell for £6,653 or

£1,598 on the 6/452.

Based on Ferranti's Argus ponsible for monitoring 500

square miles and a population of almost three mil Interest has been generator among other fire arous and it was demonstrated to over 100 fire brigades last week at Fer-ranti's Cheadle Heath site.

Demonstrating the system in the photograph are leading fire control operator Liz Quinn (left) and fire control operator Enid ries, both from the Greater Manchester County Fire Sta-



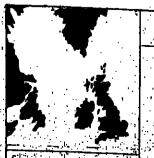
Merger 'not in interests of ITT'

separate unit without the need month lease.

to be prepared for printing on a rent for £247 a month for a 12-

dustry will definitely not Plessey Ltd. The suggestion of include a merger of STC and such a merger was reviewed and Plessey, according to ITT's head evaluated recently and was

FUTURE restructuring of the UK telecommunications in major British subsidiary, with office in New York. A company statement said, "ITT is not interests of ITT shareholders."

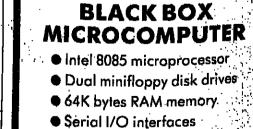


Athenic Computer Leasing Ltd 27 Chancery Lane, London WC2 Tet 01-405 8238, Tetal: 28834.

ATLANTIC **AVAILABLE EX-STOCK**

370/145.102 — fully featured 370/135.100 — fully featured

370/148. KOQ — basic machine - please call us for low-cost flexible leasing terms.



 Floppy disk operating system Advanced BASIC interpreter

 FORTRAN IV compiler ● ANS COBOL 74 compiler

30-32 Neal Street, Landon WC2H 9PS Telephone 01-836 4663, Telex 298453

Frinted in Great Britain by Q.B. Limited and Colchester, CC3 31J, and published by PC gentles. Press Ltd., Dorset House, Stamford Steel, Limited and Colchester.



Number 627

scribed so far in unofficial

reports (see page 5) appear to be

'a compromise to please

nobody," according to Ted Cluff.

secretary-general of the In-

stitute of Data Processing

He also casts some doubt on

Protection Committee, as de- should be controlled. This is in-

Thursday, November 16, 1978

banks laid down by statute. the hands of a Data Protection Thus it is unclear, Cluff says. Authority. The law can be too

The of the facilities of the same of the

Price 18p

⊃ FROM £495

NEWBURY

Visual Display Terminals

PRICES

Newbury Laboratories Ltd. Head Office & Sales King Street, Odiham

Hampshire RG25 1NN Tel 025-671 2910 Telox. 858815

Briefing

Operation

Heath in the Computer.

Processing Ltd centre 4:

System 4/72s, CDP is per

to migrate to 2900 (see Some companies with

already have their owns.

Book publisher Hamiyaa

dependent with an INTE

and a Prime 300 mmo 🔑

IPC Magazines has a Pini

and plans for a second?

and has chosen to w.

operational control ordi

installation but lease pr

Legal publisher But

wants an entirely it

operation with its owa?

ment staff, and is 數學

terms of a Dighal PDP-11/70, while Mark

Press, whose main miles

he on the 2900s, have the mini. Prime, DEC for

Data General and Her

Packard are all contenders Odhams Press already h

own development staff, but

Teanico bureau, set up !

all its applications (

development to staff &

wards Heath.

VW may take Nixdorf stake SEEKING capital to enable the

company to maintain its rapid growth rate and better exploit sternational markets, Nixdort Computer is discussing an incomputing control to the letters. Computer is discussing an incomputing control to the letters. German motor giant Volks-Publishing Corpolition wagen which would give the international are under to substantial minority sion. stake in the Paderborn com-Operations are now street manufacturer.

Increased market effort for tially concentrated at his new Nixdorf products like the 8811 data telephone and 8815 word processor would result from such a deal.

Prime targets

COMPUTER systems in government departments, particularly tax, social services and immigration departments, could be prime targets if civil servants decide to take industrial action in their current pay negotiations, which have been held up pending a much delayed report from the independent Pay Research Unit. Interview with the deputy general secretary of the Society of Civil and Public Servants — page 14.

MP attacks ICL

LABOUR MP Bob Hughes has been told that the Attorney Genhas no evidence that there are grounds for investigating ICL's connection with Rhodesia. But Hughes, who is chairman of the Anti-Apartheid Movement, has been asked to provide further evidence to support a claim he made in Parliament last week that an advertisement offering services for ICL equipment in South Africa should lend to a scrutiny of ICL operations in southern Africa.

'Probe secret service'—Benn

THE secret service should have it computer-based files subject to public accountability according to the Home Policy Computer of the Labour Party, which is chaired by Energy slinister Tony Benn. The computes wants an inquiry into the Public accountability of the services to avoid the services to avoid the services that is part of an "annabite that is part of an "appa-rius which is not under demo-tic attc control."

Anters stop

BUFI ICIENT order rates are reason given by Data 100 for affection to stop selling its OEM without line of 860 and 900 liters. The company will contact to build low speed printers its with the systems it sells than users and will carry on ming its line of partridge discontacts to the OEM market.

Chinese pay-off The years of intensive effort in

king have begun to pay off for-Grecified number and type of uninals. Oliverti is also dis-ting technology transfer and Possibility of Setting up hufacturing plants in China China - page 5.

Cluff suggests that the com mittee has "dodged a number of the issues" by recommending the correctness of the reports on that a regulatory agency set up the DPC proposals, which say codes of practice instead of

adequate, Cluff says, and claims

there are other indications that

the committee recommends

control of all data handled

automatically.

sumer Credit Act. Hugh Pitcher of the National Computing Centre, on the other hand, was broadly in agreement with the "pragmatic" approach

whether citizens will have a

right to see and correct infor-

mation held on them, as they

already have under the Con-

Privacy proposals 'compromise to please nobody'

with national security. What tems. was wanted was public accountability, he said, not direct public control, and therefore for every

insensitive to details, he said.

knowledge that it exists, what Authority. The law can be too type it is, and who has access to it. Then partial exemptions He criticised, however, the could be given in situations notion of blanket exemption where the actual information on from registration for some sys- a system could not be released. tems such as those connected as with police or security sys-

> 😝 Aien Benjamin on privacy, page 22.

Royal touch in Mexico

THE Duke of Kent (centre), Lord Chalfont (right) and Sue Hickmett (left) study terminals attached to a System Ten computer on the ICL stand at the British Industrial Exhibition, which has been taking place all this week in Mexico City. ICL SA, 5106. 51% owned by Moxican Interests, was the only computer company exhibiting at this, the largest exposition staged by the British Oversess Trade Board in

The Duke is vice-president of the BOTB, Lord Chalfont is pre-sident of the exhibition, and Sue Hickmett is publicity manager for ICL's international division.

The show was opened by Pre-sident Lopez Portillo of Moxico, who has spent the first two years of his term of office gearing up featured.

his country's acquemy to capita oil which have just been discor-

ICL hopes to win a substantia share of the computer business and as part of the recent mission to Mexico, formally announced its intention of selling large-scale 2900s in Mexico (CW, September 14). ICL SA was formed following

the acquisition and restructuring of Singer's Mexican subsidiary which sold System Ten and 1500 in the Central American republic for several years. On the stand was a System Ten demonstrating the SAFES production control and STARS accounting pack-

Deadlines put on IBM orders

THE attractiveness of IBM's two latest releases, the 8100 distributed processing system an the System 38 "small" database business machine, has led the company to impose deadlines as a means of "rationing" deliveries. And, despite these two sales successes, more major sales-boosting announcements are expected soon from IBM, including up to four more 8100 models, quantity discounts on the Series 1 minicomputer, a new System 36 between the 34 and 38, and a lower cost version of the 5110 desk top system.

November 30 is the deadline for IBM users in Europe to place orders for the 8100 distributed processing system if they want to stand a chance of a delivery not too long after the end of

The deadline for System 38 orders was last Friday, November 10, and one of the first UK customers to place an order before then was the Data-Link bureau, which is also planning to set up a System 38 con-

The place of each customer in the delivery queue will be determined by a lottery in the same way that deliveries of the 3031 and 3032 mainframes were ran-

With the 8100, the situation is made somewhat more complex Turn to page 2 by the fact that IBM has pro-

"windows" for placing orders. The first "window" closed at the end of October and orders placed before then will get priority over those placed during the second "window." The predictions about IBM's future announcements were

made in London last week by Dale Kutnick, consultant with Yankee Group of Cambridge, Massachusetts. Speaking at the Information Studies Ltd conference "Communicating with IBM," Kutnick was adamant that the \$100 an-

was but the tip of a very large "I know that there are 8150

nouncement (CW, October 12),

and 8160 models on the way and

sarvice

LOW profitability by IBM standards looks like the reason for the company's decision to stop selling the Remote Batch Processing service run at its bureau centre at Wars .ck.

RBP comprises three main applications packages: Prince. Production Requirements and Inventory Control Evaluation; Caposs, Capacity Planning and Operations Sequencing System:

Turn to page 15

Computers in schools project

value of computers as an microelectronics. educational resource, as well as their importance in industry, is one of the main aims of the second phase of the Schools Council project "Computers in the Curriculum", which has just been announced.

The Department of Education letter sent to education authorities, teachers associations, and

MAKING teachers aware of the out the Department's views on The Schools Council project

> aims to produce teaching materials in a range of subjects to help reachers use computers in their course work. This second phase, costing £70,000, has been expanded to include mathematics, graphics and history, Mar

curves and so forth.

Analysis of census data is the main use for computers on the history side of the project. Project staff are co-operating with local authorities to get census data going back to the mid-1800s available in machine-readable

According to the DES' letter. been excluded because of the the feasibility of a national prolack of cheap high-definition gramme to help schools become industrial organisations, setting graphics terminals for drawing fully aware of microelectronics.

COMPUTER WEEKLY'S INSIDE NEWS

WINNING THE POOLS

Predicting football results might seem a long way from cybernetics research. But Professor of Cybernetics at Brunel University, Frank George, believes that the unpredictability of gambling games can elucidate certain fearning problems. So he has written a program for the pools which is performing remarkably eugoessfully. Read all about it. Page 4

TIGHT CONTRACTS

Part of the mythology of computing techniques is that it is difficult to predict development timescales and performance so it is difficult to put too many appoints into con-

tracts. Tom Gilb, however, believes that the portability or conversion ability of a system should be made part of the contract.

WORKING ABROAD

"Have Cobol, will travel" has always been an attractive inducealways been an etractive induce-ment for becoming a computer professional, with so much scope for working around the world in reality, however, working outside the UK can have as many pittells as loys, as recruitment specialist John Goldsmith explains: Page 12

Voice storage net Software File Programmer Notes

Computerview on Prestel

Focus on info explosion Downtime by Chad

ALSO...

People and Events
Xerox Alto at White House Micro News Letters to the Editor Principles of privacy Prestel in America

APPOINTMENTS PAGES 23-63

YSTEMS Computer and Ancillary Equipment UMITED

CUB an incredibly low-cost Visual Display Terminel compraint separate 80 key keyboard 12 C R T Displaying 16 lines of 84 clear upper and lower case characters optional underscon

SERIES 026 Compact well styled visual dis play forminal features separate contaction keyboard, anti-glare screen, high definition? - 12 dol upper and fower case cheracter set. Blandard model includes CCITT V24 and 20mh interfaces. 8 acticulates transmission speeds. 24 lines - 80 Characters single and double line spacing, double width characters play 1 d other selectable character highlights.

SERIES 224 lugh quality page buffered terminal features teparate 84 key keyboard including numeric and control chystera, anti-gase screen displaying 1920 high destraiton 7 - 12 dot characters from the full ASCII reportoire. Modets aveilable in this series with feat editing, protected formal, tabulation, oursiomer delined character, sold and keyboards Communication lacilities include passudo-synchronous opelátion.

Cifor terminas are manufactured in the UK. All models are bovered by 12 months.

All models ere towered by a 12 months warranty and bagged by a cabable tochnical appoint and service organisation. Avro Way, Bowerhill, Melicsham

Wiltshire SN12 6TP Telephone Melksham (0225) 702364 & 704502



建筑设置









Vol. 25 No. 827

Editor Malcolm Peltu 01-261 8033 Deputy Editor Tony Higgins

Advertisement Manager
Harry Hutson 01-261 8022 Class Ad Manager Brian Durrent 01-261 8597

IPC Electrical Electronic Press Ltd, Dorset House, Stamford Street, London, SE1 SLU. Pelephen: G1-251 8000, Telegrems/Teles: 25137 BISPRS G

Branch Offices: Birminghem: 202 Lynton House, Walsalf Road, Birmingham 278, Telaphone 021-356 4838

Menchester: Stellem House, TalborRoad Stretford, Manchester M32 Telephone OE1-872 421 (

New York: 208 East 42nd Street New York: NY 10017 Tel (212) 887 2080 Telex 421710 Published weekly on Thursday

Registered at the Post Office as a newspaper. Page per copy 18p * (PC Business Press Ltd 1978.

Members of Computer Weekly staff may be contacted directly on the extensions listed below. Other departments in Doraet House may be obtained by disiling (01) 261 8000.

EDITORIAL 261 8344 261 8031 261 8303 261 8025 261 8806 261 8170 261 8036 261 8719 261 8042 261 8042 Tim Palmer
Peter Hewitt
Rary Johnston
Martin Banks

061-672 4211

021-356 4838

021-355 4838

ADVERTISING Display Lloyd Collins Stuart Moore Steve Bass

Production lan Carter Ken Walford

Emputer Washy is sent from of charge to the following categories is the UK and Ero only: Company directors, company generatives, management services exacutives, civil servants responsible for computing, management somewhar computing to an exact sectors. Descriptions and sectors, programmers, operators, computer sectors, programmers, operators, computer sectors, programmers, operators, computer sectors, field endeare.

Subscriptions for readers outgide the above cells goriner One year, UK *£14.5% overseas £26. USA, Canada 852. Students £7.30, overseas £26. USA (1846. 575. Afronti 2730 overseas £50.6% a Ukirthidon) Lini, Ophibid House, Perrymbout Road, Haywards Reath, Sussex RH18 50H. Teb 0444 55168.

Computer Weekly has a circulation sech week of over \$2,000 including the

seen week und acted circulation in the UK. The international edition, which is published 10 times a year, has a circulation of over 94,000.

ISSN 0010-478

MIND GAMES

The world's largest range of over 3,000 games and puzzles — a fascinating selection in which skill, apritude.

Coetle Street, Kingston-on-Themes (01-549 8488). Personal shoppers wel-come at both branches or order by post from W1 Centre.

Why Super Prestel is not exactly magic

world lead in television; but that retrieval. Potentially, however, know-how spreads, the Post pioneering work is of little comit provides all the varied options mercial benefit today. So what practical benefit to Britain will vanced computer-based comvanced computer-based comaccrue from the Post Office's munications service, including current lead in another mass bureau-style operations and information medium, viewdata? even electronic mail. Having gone through the At present, the Post Office's Prestel viewdata is offered primarily as a TV-based service for

DURING the last 18 months or

so, my company has been wor-

king a lot with medical ultra-

sound manufacturers, pro-

ducing combined Polaroid/

CCTV Systems for their dis-

plays. Medical ultrasound sys-

tems work through a hand-held.

body contact transducer boun-

cing sound waves off the inner

organs through a large number

of microphone/speaker ele-

ments, processing the results

and building up a corresponding

The trouble is that the dis-

plays show the discrete elements

of its composition, so manufa-

cturers are using the delay characteristics of the GDS vidicon

tube CCTV camera to merge

effectively the elements of the

display and make it more of the

The system also enlarges the image size and add TV-

the patient's clinical condition.

compatibility for video-taping

Well, that's the background.

Recently, however, a well

known manufacturer came to

us. His display had built-in.

electronic, video scan conver-

sion and output, but still had the

discrete element problem. The

solution was effectively to de-

grade the image by viewing the

video monitor through a video

camera! As usual, the effect was

good: the elements merged with

no loss of grey scale and the

subjective impression was of a more meaningful picture.

digital readout from the elec-

tronic calipers provided as part

of the display, being very small

and at the edge of the picture,

was degraded beyond an

acceptable level. We did

ultimately find a solution to get

the best of both worlds, but the

problem exemplified the com-

monly met syndrome (and this

Solve a bug, create another

You sometimes wonder why

But call it, please, RESEARCH,

Submitted by John Davidson,

managing director of Graphic Dis-play Systems of Cambridge, who wins this week's £6 interrupt prize.

It gives much pleasure to the

week's moral):

However, in the process, the

mush that the body is.

picture on an oscilloscope.

viewdata learning cycle with Prestel, the Post Office is currently in a position to assist other telecommunications supvices by providing know-how, systems and software.

In terms of providing a national public service, Prestel is also probably at least two year's However, when we look at the

viewdata concept, as opposed to requirements, the Prestel lead is

Like television, there is "noas Prestel's international operations director remarked last the information to be used on

Office will have little to export. So the Prestel export earning potential is a race against time, a race in which rivals, particularly the French, are placing as many hurdles as possible to hinder the Post Office. Corporations like GTE and

Texas Instruments are also getting into the viewdata act, while pliers in setting up similar ser- such as IBM, Xerox and AT&T are committed to deep involvement in the provision of products and services which overlap significantly with Prestel canabilities

Perhaps most significantly Prestel does give the UK industry advanced warning that we are on the threshold of the growth of new world markets in information technology-based products and services, ranging from integrated video/computer home "terminals" to markets for width techniques - the trans-

for quantity Series 1 ordinether within a fortnight or a However, the key challenge being faced by the British and other European PTTs, is the development of adequate high bandwidth telecommunications capabilities; and the European PTTs do not have a good record in this area.

From front page

Kutnick.

l believe there will also be a 8120 and an 8110 below their

Kutnick expected discor-

next year and commented the

wide range of potential

tomers, among them word; cessing specialist Vydec,

only waiting for discount

place a big order. He estima

hat 4,000 would have been

livered by the end of the year

Although convinced the

System 36 was on the way is

IBM's General Systems Date:

he was uncertain what to a

pect: it could be a compact upgrade from the System 4.

slimmed down datab

machine based on the System's

in the personal company

market, he said that IBM to

determined to be in the thirk

it. "They have had a floor

orders for the \$12 to \$15 Mis

desk-top machine since there

nounced it in February and

are emphasising sale rates

lease, so I expect a little but

at half the price in late 1979

The 8100, he said, was lev

most significant announce:

since the 370 which would kee

threat to the minimakent:

cularly the smaller love.

8100 was by no mean 🕾

sultant David Hebdich

why everyone was soci

about it, pointing out b.:

were many already a.

From £1195

From £1935

From **£86**5

From £1995

From £1860

£1600

TERMINALS

Newbury Labs' latest range of British VDU

High speed, paper tape reader punch.

New T-1612 160 c.p.s. bi-directional

TALLY keyboard printer. Wide range of other

LA36 DECwriter II

LS120 DECwriter III

paper-tape reader punch.

Acoustic coupler.

LA 180 DEC printer I

ASR DECwriter II incorporating

SYSTEMS

Wilkes Computing Ltd

LSI-11 Modules - ex stock.

PDP II-03 with order process

Tally printers also available.

VT100 Video terminal

models, he anticipated However, enthusiamate:

and 40 so far announced

The Prestel back-slupping should also be tempered by the following two omens:

Firstly, a US report (CW, October 12) predicted that there will be a billion-dollar market soon for integrated video/ computer home terminals — and it will be dominated by manufacturers like IBM and Texas Instruments, not current

Secondly, although the Japanese viewdata system Captains might currently be three years behind Prestel, as the Post Office claims, it is designed to be most effective with high band-

The Information Explosion

a very special meaning for the

DP managers are in danger of being swamped by the flow of printed information. Given the opportunity, most of those involved would welcome the chance to join a Timber Preservation Society.

IPC's Computer Weekly, Data Processing, Systems International and Computer Products International are not alone in claiming space on the DP manager's desk. Overflow conlingency plans have constantly to be revised in order that access can be gained to the office.

Attempting to keep pace with all DP publications, whether weekly, monthly or even yearly, requires much stamina, time and space, plus a considerable amount of tolerance. Absorbing all the relevant information calls for memory banks of the exceptional and random kind.

Apart from the trade press. there are the many individual newsletters and publications issued by manufacturers, service industries and professional

Can the ever diligent DPM

Can the responsible DP professional ignore the daily postal input of sales literature, broch-

THE information explosion has "ures and general purpose in-

But these print runs show no

trary, as the DP industry widens its sphere of operations into such areas as the electronic office, the DP presses seem to be working in flat-out mode. Unfortunately, most DPMs are already structured in full-

time mode. Time resources are already fully accounted: between adjudicating on demarcation disputes affecting the data prep and control departments, sorting out local user problems or evaluating new equipment, systems or packages, the DPM has to maintain training plans, manning levels, budgets and strategy - apart from such matters as work processing and production. What is needed is a daily publication on the lines of

afford to ignore the contents of one immune. Computer Weekly the bumph issued by these com- and one of London's commercial message is missed during the

> is not as yet under assault from the book publishing world, as a visit to the recent London Book Fair would have confirmed. There among such volumes as Observations on the goat, How to build your own portable garage, and Secrets of staying slim, only one computer publisher, input Two Nine, was present. Perhaps the book publishing companies are not keen to compete in a market-place covered by the periodical

capability and more f In this context, he po-DP manager. Especially when it is his desk which is bearing the foolish) manager who consigns could well be titled Who has the foolish) manager who consigns the need to add addicate to expand the number of munications lines supported

of three areas making up its Systems Language, is expected current project on software por- to be announced shortly. tability (CW, August 10). A consortium consisting of that their consortium would be Leasco Software, Christian examining ten minicomputers in Rovsing of Denmark, and total, all of which would be Selenia SpA of Italy has been awarded the study of the com- DEC

And the study on conversion the major operating system intools is to be undertaken by a terfaces on each machine. Subteam drawn from Software sequently, they would attempt Sciences, CERCI of France, and to devise a standard and cost it.

mon software interface for

EEC software

awarded by the EEC in two out that of the projected European A spokesman for Leasco said

ware architecture. Leasco would be studying the ICL 2903 and 2904. Ferranti's Argus, and a DEC PDP-11, European with the exception of probably the 11/70.

The first phase of the study would be directed at analysing dorf would be examined by Christian Roysing, while Selenia would be responsible for Telemechanique and Olivetti o devise a standard and cost it. systems in addition to its own A major aspect of the work, he GT150.

'City does not understand high technology'-venture capital chief

Two UK houses win

FAILURE of traditional sources of finance for small technology-based companies has led to the creation of another new scheme aimed at such ventures, this time from Electronic Associates Ltd. Last week, former merchant banker Dr Stephen Castell announced his new company which also aims at stimulating new business activities (CW, November 9).

new company taking up to 10%

of EAL's available resources.

The intention is that all the new

companies will be attaining £1

million turnovers within five

money available for this exercise

stems from its relationship with

Electronic Associates Inc of

New Jersey, USA, EAL was, un-

til 18 months ago, a wholly

owned subsidiary of EAI. At that time it was bought from the US

company by the British direc-

working party to be established

next month by the London

Chamber of Commerce aimed at

encouraging large companies to

Agency and to include Shell,

Announcing the EAL scheme, taking a theoretical maximum which hopes to create a of 55% of the equity, with each grouping of about ten new companies under its umbrella over the next five years, company chairman Dr Bernard "Pat Murphy condemned both private and public sources for folling to create an environment in Britain in which new companies can start and flourish.

"Private capital doesn't really exist now," he said, "and though bureaucrats are officially thinking 'small is beautiful,' they have little idea how to achieve

As for the City institutions and banks, he said that they

• IBM is to be one member of a showed a lack of understanding of high technology subjects and were driven too much by a desire to back only "racing cer-

EAL has already taken two don. Impetus for the establishcompanies under its wing! Cam-ment of such a working party, to hridge Electronic Workshop, be called the London Enterprise which manufactures sound systems and communications equipment, and Robel Elec- dustrial and Commercial fronics, which is to produce Finance Corp as well as IBM, has it is looking to add about two aimed at reviving inner cities

Marks and Spencer and the Income from government policies companies a year, in each case and helping small companies. Call for world probe into IBM

bargaining with employees A WORLD conference inquiring countries and collective work into the promotion of trade agreements with work councils on conditions of employment in

Webb, national officer for ASTMS, is acted upon. Speuking at an International detaiworkers Federation conference earlier this month in teneva. Webb proposed that a unference involving IMF delegates from all over the world hould start collecting information from IBM on its differing methods of negotiating with

union organisation in IBM may

in some countries IBM has fmployer federations and in Sweden for example, it goes through unions. In some countries it just has staff agreements," sald Webb. An IBM spokesman said.

IBM has collective agreements applying in all 18 countries of rope, including Israel. In adlition, we negotiate company level agreements in several

COUPLERS MOORE REED & CO. LTD. Malworth, Andover, Henry

soon be held if a proposal by Tim a few other countries, in line with the laws of those coun-

Webb added that ASTMS has regular contact with the IBM Workers' Association in the US. "It is very much an underground group and we contact them via a post box number and a pseudo-

China's No 2 calls on ICL TWO ICL 1900s - a 1905 and a

1903 - have been compiling statistics for the Chinese government since the mid 1960s. but following a visit by vicepremier Wang Chen to ICL in central London this week, the company is hoping to win some major new contracts in the People's Republic.
Vice-premier Wang has been

making an intensive tour of UK companies in the high technology, and defence fields, including GEC's Marconi sub-sidiary, as part of China's quest for the technology it needs to modernise under Chairman Hua's new policy (CW, April 13).

portability contracts whether the incorporation of microprocessors could be used to overcome differences in soft-

> Minicomputers from Philips. Siemens, Telefunken, and Nix-

compared fairly with those of other companies, but hoped that arbitration would lead to a mutually acceptable solution.
Talks on the issue have been going on since May.

Cadbury Schweppes gives user view of IBM's SNA

any authorised remote user to FEELING that they are being treated "like glpsies", ICL mar-keting division managers are access systems software available on the central IBM maintaking a dispute on relocation expenses to the independent ACAS conciliation service. frames, such as the CICS telealternative to IBM's Systems SNA.

Between 70 and 100 people Network Architecture. are involved, and some 50 have joined ASTMS. Transferred rom Putney to Bracknell, on reached at Cadbury-Schweppes acceptable terms, two years ago, they have now been moved after examining the available heard last week. Speaking at the ISL "Com-

Martin Roberts, chairman of the ASTMS group of managers, told Computer Weekly that where last time ICL paid two years' travel costs, it now only offered only six months' ex-penses, with a limited tax-free element. Qualification for elocation expenses is also more ICL said it believed that terms

Managers'

dispute

for ACAS

tured something like APL which cessor excessively big.

municating with IBM" conference (see page I), Mike Berry,

head of computing services at

Cadbury Schweppes, sald that

Sharing Option and Virtual

Machine Conversational Moni-

favour of the VSPC timesharing

WITH a requirement to enable would enable non-professional to write programs, and one with interactive development facilities for DP professionals." Once VSPC had been selected, use of processing monitor or IMS the VTAM access method was database, there was no realistic required, which in turn dictated

This was the conclusion isms of SNA, notably the Advanced Communication Function, which enables multiple hosts to be accessed in an SNA network. He sees ACF as designed more to confuse the plug-compatible suppliers than to help users, although the multiple host feature is essential to Cadbury Schweppes' plans since the decision to go SNA was they currently have two hosts, a 3031 and a 158, at Bournville. confirmed once the IBM Time

He conceded that VTAM had improved, but considered that it tor System had been rejected in was still not reliable enough. He has also found implementation of the 3705 front-ends and con-"The prime requirements centrators to be timewere a system in which we ex- consuming, tricky, error-prone pected substantial future IBM and a weak link in the whole development, one which fea- concept, and thought the pro-

2200 IMVP. The universal small business computer. Wang would not be where it is today if Find out about the 2200 series and its



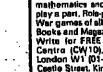
it still made desk top calculators rather than computers. Consistently one of America's top ten fastest growing companies Wang now boasts the second largest installed base of small business systems in North America.

Wang's 2200 series of computers covers 80% of the market's needs and the MVP is one of the latest processors

The multi-programming 2200MVP supports up to eight terminals and car offer 256 Kbytes of main memory and 80 Mbytes of disc stotage, it can communicate as part of a network and with most maintrames, and like all Wang computers it allows easy, expansion potential for your applications. There could be much more happening out there than you ever imagined.



Wang (UK) Limited Argyle House, Joel Street Northwood Hills, Middlesex Branch offices: London; 01-499 6169 Southern: Northwood 28211 Midlands Rugby 78321 Northern: Harrogale 61381 ..



mathematics and logical deduction all play a part, Role-playing fantasy games. War games of all eras, Abstract games, Books and Magazines.
Write for FREE Catalogue to Game-Centra (CW10), 16 Harway Street London W1 (01-636-8278). Also at 1

COMPUTER WEEKLY NOVEMBER 14, 1968

Ten years ago...

based seat reservation system. Boadices, was officially inauguproject in the UK to take DP into schools was won from the Deschools was won from the Department of Education and Science, and it was planned to set up a £300,000 system at Hatfield College of Technology, Herts . . . Three groups of Trustee Savings Banke in the Liverpool, Manchester and West Midlands areas were to combine to purchase a computer system . . The University Computing Co (UK) planned to install a second Univer 1108,

dustry bumph?

all such mailing to the dump industry?

sign of abatement. On the con-

Which Project? For the DPM there is no escape from the computer world. Whether at the breakfast table or Godalming Station, he finds his daily newspaper now regularly features the computing scene. Even the car commuter is radio stations have linked forces to present a selection of choice DP jobs. Just in case the

> morning rush hour, the feature is repeated in the evening.
> Fortunately, the DP manager

Next year, Input Two-Nine plans to produce a Who's Who in the DP industry?

"learning" capability of pro- methods to solving certain Great Missenden, Bucks.

dream to brighten the quick- the apparently unpredictable. darkening days of autumn. Frank George, professor of football pools system he will Forecasting football also poses Cybernetics at Brunel Univer- with Dr Roger Hartley and the control of the cont some interesting systems prob- sity, has been interested for as part of a computer to the comp lems relating to the heuristic some years in applying heuristic operated by Topaz Books

Winning the football pools is a grammed machines to predict gambling games.

In this article he discuss

This quadrad test records

last three home or away in.

and whether or not theyer.

Indeed the sequential and

is one step more sophise.

and shows, for example, its

hest chance of a draw sat:

team with a record HHH r

successive home wins it:

an away team with HT ?

Successive away lossnir

vided it gets suitable wegt

The database of results

season is updated erby

prior to forecast and

updating includes the re-

the last two games place

Then the forecast is:

ti ii is less than eigt≃

recycling takes placet

the number up to eight

is done by relaxing t

tions for a score-di-

ticiently to increase the

We then take the in-

likely draws and mix then

the forecast score-draws.

the lines of the chosen sort

updates the club record of:

teum appearing on the ?

We are all the time act."

lating more information in monitoring forecasts with

eye to modifying the programed when it is necessary. It

has been, so far, a ceru amount of "fine tune"

necessary, but no major this.

So it is that the proj-

for egast score-draws.

"lengue" position

on the three earlier tests

How to come up

THESE last few weeks have seen

a very interesting, if not to say

come about in a relatively new

field of activity of computing —

There may be more, but

everyone who is successful does

not necessarily tell us. But that

there were at least 20 first

I will now go back to the be-

ginning of the story. With the

dividends, we are sure.

programs for football pools.

other day to a demonstration of OCR ScanData's clever new machine that will read handwritten characters. A special attraction of the demo, the invitation said, will be the presence of Kenneth Warren MP, the well-known campaigner

Kenneth Warren

A pretty impressive endorement, eh?

Still, I'm sure Mr Warren won't mind me revealing this fact about his commercial int erests. After all he is chairman of the Freedom of Information

Keeping it clean in the valleys

MRS WHITEHOUSE would be less forthright, "We're a good, coming from their computers. No, I don't mean fluff from printer ribbons — it seems lewd and lascivious programming staff have been using the council's computer to print out copies of the Ballad of Eskimo Nell, and even —

"Powys is a clean local

Go forth and multiply...

LEASED LINES

We had lunch the other day with Frank "IBM" Cary, at the American Chamber of

Commerce Unfortunately, I did not realise until too late, that there were to be 800 other people present as well. Stilf, we were quite impressed and think IBM are going

J.R. has decided to produce a brochure, with photographs, about all of us in

My suggestion that the Company should provide toupeas on a 'Lease A Toupe' basis left MRD unamused

The flavour this month is IBM Peripherals. We will buy, rent, lease, sell, exchange of W.H.Y. and have the following equipment for your delectation.

3330 Disc Drives (Model 1 & 11) 3340 / 44 Disc Drives

If you have IBM equipment on rental, don't buy it or send it back to IBM without contacting us first. We may be able to buy it from you under the SO1 Plan and show you a profit whilst you take now aquipment for your site.

MRD reminds me that you don't have to tease a computer from us — you can buy it instead. J.R. has a 4 megabyte 3032 evallable during March, 1979, for saig at IBM

COMPUTER CAPITAL

2-4 KING STREET, ST. JAMES'S, LONDON SW1-TELEPHONE 01-830 0361. TELEX 897949

ISC, IBM Memory, 2151, 2152, etc.
 ISC, IBM Memory, Channels, etc.

3830 Control Units 3211 / 3811 Printers & Control Unit

I MRD and OR. B., naither of whom have m

Peripherals 3420 Tape Drives (all Models and Control Units)

PERUSING the latest edition puters 375%, the number of of our industrial bible, the Computer Users' Year Book, I 614%. notice that over the last ten years, while the number of in-171% and the number of com- man who sells the shovels . .

"consultants etc" has gone up

Harry Belsey, of BP, has a choice phrase for this sort of stallations listed has increased thing: "In the gold rush, it's the

WE received an invitation the for the computer industry in on the pools-

"has expressed great interest ScanData of Alpha Handprint OCR and has asked us to include him in the whole of our Press conference and demonstration to get first-hand experience of Alpha Handprint

Now, the invitation was sent out by a public relations firm called Parsons Tozer & Newton. Interestingly enough, i falls to mention that one of the directors of Parsons Tozer &

proud. County councillors in clean-living community," he Powys are taking firm action—said. "There will be an investo stamp out the filth that is tigation immediately and those wait for it - pictures of Raquel

When shown one of the print-outs, Powys chief a computer for this sort of executive Thomas Young said, thing - suggest they use the authority. To discover that this stead.

responsible will be taken to Good on yer, gentlemen When you have stuck your-

development of heuristic methods in computing that enable the handling of all sorts of selves together again after being shattered, I'm sure we conditions of uncertainty, it was can rely on you to shore up clear to me some years ago that we should be able to do a great public morals in Powys. Yo might tell the culprits that deal better than chance on any there is no point at all in using sort of gambling, where some form is available. In games like roulette, or even council's copying machine in-

more in the case of fruit machines, there is little by way of form, and they are therefore sort of thing is coming from our computer is shattering."

Councillor Jim Evans was no

By the way, can anyone tell me of a dirty authority where I can get a job? probably fields best left alone. This leaves quite a number of remaining fields and I will in this article concentrate on football

but it did not work particularly well and I concluded that the heuristics every nearly guesses

at the time) were inadequate. I then spent some three years collecting a vast volume of "facts" about football results and constructed a set of Markovian type tables for successive results home matches, away matches, home and away natches mixed)

This revealed the errors in my original guesses and gave me a firm foundation for making

good forecasts. veights to league position, last match result, last-but-one match result and, if necessary,

the result before that. A further lesser weighting took place for goal difference to try to discriminate the scoredraw from the scoreless draw.

It was obvious from the first that any complete pool filled up. according to form alone would be useless. This is so because if every club played even approximately) to form, almost everyone would win and there would be very little in the win-

To deal with this very important problem we add two further one inevitable) important steps to the total forecasting process.
They are the kind of method used in actually filling up the pools form, we call it n sort) and examples of this are complete "perms", Lit-plans, V-plans, etc.

"individualisation" stage where very exciting, state of affairs the individual punter decides which sort he will use and which "unexpected draws" he will in-

by computer

Our program for football Let me explain first the conpools, written in Basic, has been cept of an unexpected draw. We know that any game could be a running for about eight weeks of. this season on an ICL 1900 sys- score-draw, but some of them tem. During the last four weeks we do not expect at all. This is it has achieved about 20 first where the best team in the leadividends on the Treble Chance, gue is at home to the worst team and several hundred other dividends spread over all three

We take the view that some of of the leading football pools these games will turn out as

then we might expect them to In particular we might expect to find "local derbys" coming out of draws, as the record book

draws or home wins in a fixture.

shows that they often do Then there is the fact that it we put "lost away" last game then we ought this is the socalled "Qualitative test") to diatinguish losing 1-0 away to the op team as opposed to losing 7-0 away to the bottom team: the difference is fairly obvious.



I wrote an early program for a score-draws and it is here where computer some four years ago, we shall introduce the first we shall introduce the first possibility of choice.

If we take some 10 games that no one, certainly no pools expert believes will be draws (this means usually a home win is forecast) then we can take thom five at a time to sort together with the other forecast draws.

The idea is clearly that we mix some uncertain forecasts; but much less often, with those that we really believe will be score-

We now come to the very important point of the sort. We have forecast, say, 18 matches, Relped by Dr Roger Hartley, I and we can label these A, B, C, D, then wrote a new program for pools forecasting which gave and R.

We now, from these eighteen matches, select 13, 14, 16 or 18 (or any other subset of 18) where we place the 18 forecast matches in order of priority. This makes it easy to pick out whatever subset

The organisation of the sort is such that we take every "expected draw" equally often or nearly so), and we combine these with one "unexpected draw" in each "line" column). The main constraints on each

line are that it should be composed of nine expected draws and one unexpected draw, and that in any set of 10 lines no two lines should have more than seven forecasts in common. We then have a "complete perm" for each line.

each line.
The other phase of individual-isation, involves using the his-todeal test and the "qualitative test". The historical test is self-

Now to the program, which we have called Forecast. We have now got to a fourth version, known as Forecast 4. It includes the league table in the

Frank

George

 Professor George has we the buckground of the wife. in A Better Bet, and the lo pools in particular in a miform of each club with a games played/points acquired ratio. From this effective league table we go on to an updated database, which shows last result and last-result-but-one, to what we call the quadrad test.

involves only minor char and both books are publish and the computer clubs a Topaz Books, High Sorti's Missenden, Bucking



Standards delay may limit Prestel revenue

DELAYS in reaching international agreements on viewhata standards are being fusiered by some of the British Post Office's rivals to try to hold back the 2/3-year lead of the UK Prestel system.

The Post Office pioneered the viewdata concept as a

that personal files on computers

Scientist last week. The article

giving details of the as yet un-

blished report was described

w the Home Office as "specula-

Islation specifying exactly how

would be too inflexible and in-

sensitive to detail, the report

ment or private, would have to

However, the authority would

have discretion to exempt sys-

tems from registration in cases

where it was not considered

it would be harder to exempt

"necessary or helpful",

be registered with the authority.

tion Committee recommends would be harmful.

according to the magazine New in this way.

personal files should be handled ' contents.

should be controlled largely by only computer systems, not

a Data Protection Authority manual files, since the original

rather than by detailed laws, terms of reference were limited

in accordance with the views to decide in the case of each

of some commentators that leg. system whether the operators

recommends, according to New codes of practice established by

Scientist, that all personal files the authority. Breaches of a code

on computers, whether govern of practice would be criminal

government systems than tion of the codes could be dealt

private ones, according to the with by the authority in formul

proposals. Police records would hearings short of going to court.

formation service (pictured right) and has already earned about £1 million in exporting its know-how and software to the West German, Dutch, Swiss and Hong Kong PTTs, with a number of other agreements due shortly

files held on computers'

The committee's report covers

In contrast to what obtains in

other countries, there would not

be a general right of citizens to have access to files about them.

It would be up to the authority

should be required to disclose its

The workings of databanks

would be controlled largely by

offences for which the authority

could take the offenders to

court. The court would have

power to impose fines or impri

sonment, and also make court

orders specifying what data

users must do to comply with

Disputes over the interpreta-

the code of practice.

of Prestel international operations, pointed out at a Press briefing last week, "There is nothing magical about Prestel" and once the know-how had spread there would be little for the Post Office to export.

by statute to govern the drafting

these would be: subjects of data

should know what information

there is about them and what

should be accurate and relevant;

data should only be used for the purpose for which it was or-

iginally obtained: data users

should not be subjected to un-

due extra cost.

purpose it is being used for; data

the codes of conduct. Among

standards bodies, the CCITT, will be in 1980. Meanwhile, the French, whose Antiope system could rival Prestel in the 80s, are vigorously opposing acceptance as an international 'Data Protection body videotex standard of the Prestel character set, which is the ISO 646 basic character standard. The French are proshould control personal posing the international reference version of ISO 646, while the Germans recently

> ● Viewdate news — page 64. Comment, page 2.

suggested a compromise.

started in a number of coun-

of one of the major internation

viewdata services should have tries. Yet the next full meeting nal telecommunications

Two new word processors from Wang

TWO word processors have been announced by Wang, one at either end of its range of screen systems. At £6,350, the System 5 is a low-cost standalone unit, and the Office Information System 140 is an extension of Wang's shared-logic machines allowing more screens and greater storage capacity.

Wang has also introduced a which has hitherto been the daisy-wheel proportionalspacing printer that it manufactures itself, and a 425 lines per minute line printer. The xerographic printer is still under de-

The System 5 comprises a screen, twin floppy discs, and daisy-wheel printer. It under-

bottom end of Wang's range and will no longer be offered. Prices for the OIS/140 start at about £20,000, and a sevenscreen system costs £45.000 making it fairly cheap compared

with other makes of stand-

cuts the existing System 10A

Heads of finance know AL ...do you?

TAL is active in many technologies, and disciplines. In data coronomications if it a world leader The IAL. capability is unique and the nature of the application package it can provide is wirle and continuously expanding

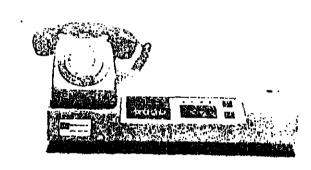
TAL numbers among its data communications clients the larger proportion of British clearing banks, several international banks, and numerous major commercial organisations in the UK, Europe and throughout the world. With bases in 50 countries and subsidiaries and associates in 10 more, IAL is particularly qualified to provide an international service.

IAL designs, develops and manufactures, through its comprehensive range of production facilities, data communications network management and control systems. Much of its work is of a brilliantly innovative nature.

Take IAL Medius Medius is an outstanding example of IAL expertise.

A modular system, IAL Medius utilizes a revolutionary concept to identify and correct data transmission. malfunctions and gives lingertip control of any size of

Visual indicators allow instant interpretations of system status, and drive modules are available which. enable control to be exercised over any distance.



DIAL IAL For fuller information of IAL data communications management and control systems telephone: 01-574 2411 or write IAL, Aeradio House, Hayes Road, Southall, Middlesex, England UB2 5NJ. Telex: 24114 Cables: INTAERIO Southall

M Aviation and Communications

Systems and Services - worldwide

not be exempt, but those con These hearings could pronounce noted to national security on users' obligations but would would be fhe registered infor- not have the power to impose mation would be open to the penalties. Appeals against DPA public for inspection, except in decisions could be taken to the the case of systems where the courts or to the Ombudsman.

Voice storage network now in use at IBM

AN EXPERIMENTAL voice Files of messages can be built storage network for recording up for later retrieval by named and retrieving messages within an office environment is in use at IBM's Yorktown Heights research centre in New York

The messages are digitally stored on a 370/168 mainframe with 100 Megabytes of disc storage online with a separate set are used to activate specific commands. em. The mainframe runs under VM/CMS, and the voice network system, which is designed pecifically for use with touchone telephones, is controlled by a System 7 process control com-

parties, and the system compresses long silences so that the playback can be more fluent than the original delivery. Messages can be timed to be delivered automatically at a given telephone, and touch-tone buttons on the telephone hand-

> IBM has not said whether it plans to market the system as a

IBM is also working on a home computer which is based on videodisc storage and the

Motorola in exchange deal with two French companies

ween Thomson and the French alonic energy agency, for a far-feaching semiconductor teah-nulogy exchange (CW, September 14).

Motorola product capability beyond an existing agreement that covered the 6800 microprocessor.

In both cases, the French companies will manufacture de-

The exchange will be used by the French companies as the basis for two new manufacturing facilities, and since the atili-birth of the much negotiated Secimos project (CW, October 19), this now represents the only aspect of the French government's "Le Plan Composant" to become reality.

AGREEMENT has finally been reached between Motorola and two French companies, the Sescosum division of Theorem 1997. Sescosem division of Thomson EFCIS, expands the latter's and EFCIS, a joint venture bet-

vices as second sources for Motorola's product line, and sell them in direct competition to the US company,

Motorola has made no comment on whether it is to have a financial stake in the two new companies, and denied sug-gestions that it would be trans-Two agreements have been from its own factory in Tou-

EDITED BY PETER HEWITT

SOFTWARE FILE-1

GILB'S MYTHODOLOGY Tandem offers end-use query language as extension of its DBMS

Control over conversion costs

ALL critical system qualities can be specified in advance of detailed system design. They can be quantified. They can be measured in practical and economic ways during all stages of development and implementation, at least with sufficient accuracy so as to give better result control than with other methods.

One of the critical qualities of any system is the portability, or conversion ability. We might be interested in immediate conversion ability of our present systems to our soon-to-be delivered machines or software; or we might be interested in controlling costs and human effort for our future hardware/software sys-When I think about how

important this factor is in economic terms, I am surprised to see the informal treatment it is given in practice. The normal method of handling it is to throw a solution at the problem and hope it will go away. Common "solutions" are Cobol, Fortran and IBM. Unfortunately, although these solutions may be better than nothing, they give very uncer-

I have recorded a number of major financial disasters which were based on this assumption. For example Ford ended up paying \$2.3 million dollars to convert its Cobol programs from IBM 360 to IBM 360 (ANS). Massey Ferguson, of Australia, lost a million the hard way. Their original

DO programmers really prefer

do many in fact hanker for the

days of twice-a-day testing

shots, albeit at the mercy of

abort-happy operators? And

which is in practice the more

These are the questions raised

by E. W. Tocher, of Southamp-

ton, who feels that online deve-

lopment is a path offering many

nitfalls to those without the dis-

'I could not agree more

strongly with Professor Wirth

that 'interactive logical debug-

ging is the greatest destroyer of

cipline of batch experience.

Australian dollars on an MIS development because it was not sufficiently portable to other corporate IBM Cobol machines (particularly those without Virtual Storage).

I have developed a measure

of portability which we have used for several years now in system specifications and this includes several legally binding contracts. In one recent case where a corporate accounting package was guaranteed portable to my client's "Computer with Cobol. from a major manufacturer' (which turned out to be an IBM 370/135), the supplier ended up paying a penalty of running the corporation's financial accounting package free of charge for one full year while he completed the necessary rewriting of the 50% Mark IV statements to Cobol, for us. at a nominal charge.

You don't need to know exactly what you will be converting to, as this case illustrates. It is sufficient to know approximately. A portability measure must be specified in terms of source and target environment (both of which can be generalised) conversionmethod and means, and the application system in question. In addition it is vital to specify that performance, operational

cost, reliability and maintainability also be kept at the same or better measurable levels as before conversion. Philips of Holland learned why

PROGRAMMER

"I have often seen program-

mers using interactive tools not

only wastefully but stupidly.

re-running in the hope of a clean

Making one-line changes and

result is not a route to deve-

loping a correct and well struc-

July 20)," writes Tocher.

tured program.'

satisfactory now and for the future, Just a lew of the many

questions to which CMG consultants have the answers.

plan for conversion of a 200 engineer-man year project IMS database from IBM to Philips computers specified three man-months effort. This worked, but the performance was 20 times worse and unac ceptable. The needed conver sion effort was in fact betweer ten and 20 man years (I got two estimates from different

Another fact that many seem to forget, however obvious it is: Conversion i more than Cobol or Fortran program logic. There are files to be converted, Job Contro statements, machine languag subroutines, and supporting software such as database management software o telecommunications software Then, of course, there may be operator instructions recovery and other utility soft instructions ware. One British installation reported 27,000 job control

statements to worry about. Portability can be quantified in terms of percent salvage value. Ninety-five per cent portability between two en vironments means that only five per cent will have to be expended of what it would cost to build a new system without the benefit of direct conversion

from the old logic. One IBM user I know got £200,000 in cash and equipment from IBM because they knew how to get conversion_costs

misuse the facility is iden-

"Under George 3 and MOP,

tilled by Tocher as the 'pre-

scriptive dynamic" of many

for instance, you are typically logged out after 45 seconds if

you haven't made an entry. On a

busy system, it can be some

minutes before you are again

ries along terminal users, en-

couraging them to enter any-

thing rather than be discon-

nected. This is an example of the

ditioning human users to work

rationale of the machine con-

CR9 9EB.

The system in this way hur-

timesharing systems.

given access."

Get yours too!

has been announced by Tandem - database design. Computers as an extension of its relational database manage

ment system Enscribe. Called Enform, an unusual feature of the language is that it can be used from within application programs in addition to being invoked interactively from terminals.

Enform, which is nonprocedural, can therefore be used as a report generator within programs written in Cobol, Fortran, or TAL - Tan-

dem's own application language. Reporting facilities, which include automatic sorting, also encompass the production of averages, percentages, and several levels of total. Input can be from multiple files, correlated

Puzzler

USING the digits 1 to 9 once automatic routeing of data, with each, make up two numbers a tie-break algorithm where two which multiply together to give the largest possible product. The first logical "try" is 9,876 times

"the network dynamically in the 54,321, but this produces a much event of line failure. lower total than the maximum. See page 61 for solution.

• Nioll McPhillips, of Dublin, has sent in no fewer than 40 different solutions to the "mixed fractions" Puzzler (CW, October 5), which required

to equal 100. Maximum "difference" between the two sides, according to his list, arises from the answer

The pitfalls of online development

Tocher notes that fixedlength, pre-allocated terminal

tions to the development cycle. "People are only too easily tempted into trying to achieve are over-prepared, the session

Online development systems are now in widespread use. Do others share Tocher's mishave programmers found most

London Amsterdam Fränkfurt

Tel: 01:681.7631 Rotterdem Brussels Glesgow

atmosphere of thoughtfulness essential to good programming

sessions also introduce distortoo much. Alternatively, if they

can be frustratingly short." givings and what guidelines One factor encouraging users at its pace - destroying the helpful in their effective use?

Enform carries a one-time like Enform, requires mine licence fee of £1,700 and requires costing £1,000 on each proa microcode add on costing sor. Both will be available, £1,000 per processor system. March. A microcode assist is also req

The Gosnel uired to implement Tandem's new networking capability. Guardian/Expand, which was according | announced at the same time (CW, November 9). the Project An extension of the operating Manager system, the networking subsystem makes the location of com-

AND it came to pass the s puting resources and databases Paper committed an United Plagiarism which was feed on it by the Reside, a came to it saying "Behold to the Prophet Dehit Major which lives across the time and has Knowledge of the Prophet Dehit Major which lives across the time in an Expand network transparent to operators and programmers, It can support up to 255 processor systems, each site consisting of up to 16 linked and has Knowledge of L Tandem's own communication protocol is used between

And the Paper repended Innocent Enthusias adve in fear of the Wrath of the tent Editor and bis swi Messenger which is at

(Apologies to Datese:
and thanks to the resistant
spotted that "The tup
According to the his
Manager" (Nevember):
iginally appeared to in mation's leave for Nors 1973 as "Genesis Ira 2.5". Our source white pletoly different femant failed to identify the state Michael L. Coleman.)

What's your line?

TIME SHARING BURFAUN who do not wish to take financial

COMMERCIAL BUREAUX

central processors

nand facility.

sites, but Expand also offers

support for virtual circuits on

X-25 packet-switched networks.

Features of the system include

No adjustment is required to

current applications programs

to enable them to use the Ex-

Programs may access data

resident at any point in the sys-

MANUFACTURERS OF TERMINALS and their agents of

ARGE COMPANIES with a parential telecommunication

ORGANISATIONS such as educational establishments who only have revenue budgets rather than capital budgets.

MINI COMPUTER USERS

USERS OF WORD PROCESSING SYSTEMS AND ADDRESS OF WORD PROCESSING SYSTEMS AND ADDRESS OF THE PROCESSION ADDRESS OF THE PROCESSION AND ADDRESS OF THE PROCESSION ADDRESS OF THE PROCESSION ADDRESS OF THE PROCESSION AND ADDRESS OF THE PROCESSION AND ADDRESS OF THE PROCESSION ADDRESS OF THE P

If you can identify with any of the above you should speaking to our specialists who are qualified to ask study and recommend according to your needs.

MHS Rentals personnel have considerable in-depth experience in the design and recording to your form of all types of terminal based systems as well as microcomputers and sort packwers of the flexible rental facilities on a while range of equipment from leading to the holding Data Dynamics. Texas, Digital, Translata, Diablo, Oliveti, Nasaph Texas, Texas, Digital, Translata, Diablo, Oliveti, Nasaph Texas, Digital, Francis and Texas, Digital, Francis and Texas, Digital, Parkett, Nasaph Digital Constitution of the participation of t For more information contact Mike Brooke, Telephone Byfied #51146

MBS Rentals, Aldwych House, Madeira Road, West By MBS Remain is the rental division of MBS Terminal L



SOFTWARE FILE -2

rently support Pearl.

Gesellschaft.

German joint effort on DoD1 front end

This strategy was outlined in

London last month by a speaker

at the Third Joint European/US

Software Management Con-

ference, Dr Horst Clausen, of

industrieanlagen und Betriebs

Dr Clausen noted that a major

aim of the collaborative effort

was to avoid the emergence of a

large number of mediocre trans-

A high quality compiler, pro-

acceptance of the language, he

He added that there was no

intention at the moment to force

existing projects to use the new

each developed their own.

West Germany are understood to be planning a concerted effort a produce a portable front end to be planning a concerted effort all the machines which curto produce a portable front end compiler for the Pentagon's new real time language, DoD1.

The aim of the project is to capitalise on German investment in its real time language Pearl while at the same time providing an easy route to using the new US language, currently described by the "Steelman" specification.

The envisaged front end will generate an intermediate code lators for the language, which could be the result if companies closely similar to Cimic, which is the intermediate code generated

Existing Cimic translators and ducing compact and efficient code was essential to the

Adapted for B1700 THE accounting and management information system Fact has been adapted by CMG for

the Burroughs B1700 series. Its general availability follows ČMG's implementation of the system on a 96K B1726 operated by packaging and printing firm J. Dring Ltd.

well, and Univac users.

Services offered will include systems conver-

sion, hardware and software evaluation, standards

language, but that would be introduced on a trial basis on selected new developments.

A UK consulting subsidiary has been set up by Informatics has operated a professional services

informatics, best known for its software products division in the US for many years and began to

including Mark IV. Called Informatics Consulting, offer the service in the UK in the middle of last

its principal clients will be large IBM, ICL, Honey- year. Projects to date have focussed particularly

development, systems design, and project control. Kingsway, London, WC2. Tel: 01-405 8546.

Although the DoD has an-

Honeywell data dictionary A DATA dictionary has been tion programs and the collection introduced by Honeywell for use and evaluation of database perwith its IDS/1 database formance statistics. These facilmanagement system on large-scale Series 6000 and Level 66 itles are presumably directed at the restructuring of a database

A common front-end, such as

already exists for RTL/2 and

Systems Designer's portable

way to enforce language

standardisation and could well

be the approach taken by the

the restructuring of a database in the light of actual usage Called IDS/1-DD, the system patterns. is said to analyse source prodata element usage. Dictionary indexes, where-used lists, and database chain definitions are among the many reporting functions supported.

The package is also reported

on database management systems, including

The operation is based at Africa House, 64-78

educational courses on IMS.

Fortran Forum Informatics' UK consultancy aims for big users Bookings for the Fortran Forum

(Letters, November 2), organ-ised by the BCS Fortran Specialist Group at Imperia College, London, on Friday, De cember 1, should be made wit John Roberts-Jones, c/o Miss Laura Burrell, BCS, 13 Mans field Street, London, W16

for routeing

very routes. It is written in

Fortran IV for operation on a DEC PDP-11 under RSX-11M

and is licensed at a basic price of £15,000 for five years.

Requiring 192K of memory for

implementation, the package is

to be released in the US by the

end of the year at a price of

\$14,500. The company is said to

have given no indication of

plans for a similar offering under

its more recent DBMS, IDS/2.

Latest pack NCC scheme extended to emerge is to cover limited

hardware development he NCC's Software Product LIMITED hardware development can now be funded by the around £180,000 for this devecheme (see right) is a vehicle outsing and scheduling system NCC's Software Products lopment, with a similar sum developed by Scicon Consult-Scheme in the context of pack- coming from the NRDC. Called Vanplan, the system has been specially dealgned for companies running a fleet of vehicles with multi-drop de aged hardware/software systems. And the scheme is making proposals, Ford remarked that it easier for firms to apply for a

grant, by funding up to 50% of the costs of proposing to it.

SPS is administered by the National Computing Centre on behalf of the Department of Industry. It can provide up to 50% of the investment needed to de- was its own. velop a software product in return for a share of eventual

puters, and microcomputers.

to encompass packaged hardware/software systems. We

boards or terminals, he added.

The scheme's other major in-

General's Micro Nova

"If the end product for a feasibility study is a proposal, there is a danger that it will be "Originally, all our projects written for the client. We regard were concerned with utility it as very important that a firm software for mainframes." it as very important that a firm sees the proposed product as its sees the proposed product as its commented the NCC's Fred own, and is not influenced by Ford. "With the changing marideas of what we might find ketplace, we have been inacceptable." creasingly involved with appli-

Ford added that SPS had cations software, minicomations software, minicom-lters, and microcomputers. "Early this year, there was a its fears hadn't materialised." definite extension to the scheme

the mechanism had always been

there, but it had not received

much emphasis before this year.

a feasibility study for itself, it

wouldn't feel that the product

"Previously, we felt that if a

Tax exemption

can back such systems as long as there isn't too much hardware PROPRIETARY software pack ages have been exempted from Typical hardware aspects of such a project might be the development of special interface

the newly-introduced General Sales Tax in South Africa. Revenue authorities for a while Typical hardware aspects of regarded software packages as SPS is currently assisting two tangible goods and therefore companies to develop microeligible for the 4% tax which based packages, one built on the came into effect in July. LSI-11, the other on Data

Following a representation on behalf of the software industry. The scheme's other major in-volvement with microproces-decided that the tax does not sors was blacking CAP's Micro- apply to these products after all.

DECservice, it doesn't just promise total service commitment. It guarantees it.

DECservice sets a new standard of commitment unique in the computer industry. DECservice's features make it the price/performance leader in the market.

Make comparisons. Ask around. See if any other computer company is prepared to guarantee all these vital points n its service agreement.

Call as tast as possible is nonne We guarantee to be on-site in four hours maximum. That's different.

Continuous effort. We will not stop working until your machine is back in operation. We guarantee it.

■ Action Outage A guarantee of management involvement to ensure effective repair of your system, through an alerting procedure extending to the highest levels of our international network. It guarantees that all our specialised resources are put at your disposal.

Response. Promising to answer your Computerised history of your system repair times over a specified period. It quarantees preventive action.

> Personalised service. An accountresponsible engineer will be assigned to your system: our force of more than 2000 engineers in Europe enables us to make this guarantee.

To get comprehensive information about DECservice, use the coupon.

Send to: Digital Equipment Co. Ltd. Attn: Field Service Manager Digital House, 252-256 Kings Road Reading, RG1 4H4

Digital Equipment Co. Limited

the missing link. Forging a computer system is a skilled job. Selecting Whether the system should be based on a micro, minia computer, negotiating with suppliers, designing and or mainframe computer: run in-house or through a bureau, developing software, installing equipment and training CMG consultants are able to handle the entire project from staff requires specialist experience. beginning to end. Send for the free CMG booklet which provides CMG consultants link your data processing further details of this service. needs with a knowledge of the realities of practical No stamp needed - just write or send your data processing to select the best solution. business card to: Do we need a computer? Which computer do CMG (UK) Limited we need? How can the data we have be turned into Freepost, Services useful information? Are our data processing operations Croydon,

OR LEASE

COMPUTER AND

COMMUNICATIONS

BUY

RENT

TERMINALS

Central contact point between programmers users and operations

person say that her work in- At present Janet is responsible ment volves "taking my operations for six systems which are in the knowledge and using it to the process of development; four are each project at its design stage.

And it gets better when you other two are general systems. learn that her experience totals A project committee is formed some five years in the industry for each new application. Proand includes a spell as an opera- gramming users and operations.

talking about. She is employed are all represented. as a processing liaison analyst at the Stratford, London, installa-

'When I saw Morgan that of operations. Guaranty advertising the posi- Another part of Janet's work tion in which I am now is to ensure that the documenemployed, I thought they must tation produced for use by have the right attitude to opera- operations is of a sufficiently tors and decided to give them a try," she said.

Her role involves liaising bet the operations documentation is ween operations, programming up to scratch. To see that it has and the users. (Unfortunately, many sites fail to recognise the need to run the work," she said. benefits to be gained by She is also responsible for enemploying someone to carry out suring that the operators are

Said Janet, "Actually, there well in advance of the time when are two of us. The guy I work they actually go "live." with is responsible for long-term planning and I'm responsible for gives the operators a good it in the short term. We set out to understanding of all the appliensure that all new applications cations and so greatly reduces sions of the system: OS/MFT Now MFT is, perhaps, easier conform to installation the likelihood of errors occur- (multi-programming with a for the operator to run but is a

Semi intelligent, up to 8 pages of

Centronics 779 Printer

Flexible 60-110 cps printer

Micro 800 Data Concentrator

Permits up to 8 terminals to share one telephone line.

Teletype 43 KSR

See us on Stand A2

Lear Slegler

in the person of Janet or the Janet Hall is the person I am other processing liaison analyst,

This enables her to work closely with the project team tion of Morgan Guaranty Trust. and the users to their benefit and

high standard.

'It's up to us to ensure that all all the information the operators

lectured on all new applications. Attention in these two areas

Techtran 950Microdisc

Mass storage, intelligent data

Portable multi copy impact printer in

Portable 🔼

large online applications and the This enables her to draw upon her experience and interpret the system in terms of machine requirements.

She also acts as the "central contact point for all the project teams. For example, if they need a new disc or magnetic tape they come directly to us and not to the operators."

terruptions from outside the computer room, and are able to concentrate on running the system and optimising throughput. Now in the main, users have little idea of what goes on in the

volving them in the project committees, the Morgan Guaranty Trust site ensures that they understand what happens and have the opportunity to put Thus the operators get no intheir views and problems for-

> And Janet Hall ensures that the needs of the users are met and that the addition of new applications does not impair the service they receive from the

HINT OF THE WEEK

scepted norm, operations staff can do much to increase their knowledge of the equipment with which they work. nes they will find ways to ease their own task and such

their company to economise in terms of money costs.
I make these points after considering a hint relating to printer and
wear and tear on printer ribbons, which is sent by Mr T. Turner whole
operations controller at a site in Derbyshire. He says, "We do not have a great demand for printed output and to we use an ICL (Singer) 2412/01 printer which has 132 print position and produces 160 lines of output per minute."

For over a year they had problems with the ribbons, which would ride up inside the carriage. This led to uneven wear and unit wreds. He continues, "We were told by the ICI engineers (who as xcellent in all other respects) to try some different ribbons for, at it

This they did, but with little success "as the usage varied bely 17 and 50 hours per ribbon." So they looked up ICL's Hardway Operating manual (figure 28, page 53) and examined the unit He explains, "The problem occurred as the ribbon passed below

es they were concerned, the problem was insoluble."

the guide posts of the printer's carriage."

Now, the guide posts are on a cam and can be adjusted vis to sockets by means of an allen key.

He says, "The gulde posts can be angled and, by experimenting an alter the passage of the ribbon and so prevent it iding up or down.

By this means they overcame the problem and "we are now puts ver 100 hours' use from each ribbon," he adds.

"The existence of these sockets on the guide posts is not mention anywhere and does not seem to be known to the engineers. But the djustment is simple and quick, and you don't even get your light

By Bernard Allen The laser disc that can hold 10,000 million bits

the same disc with alphanumeric data.

45,000

tracks joined

in a spiral

The transparent 12In disc used in the Philips diods laser recorder holds 45,000 tracks joined together in a spiral and

form of grooves one elahth of a

wavelength deep which enable the head to count its way to the

rack required. Each of the tracks is divided

nto 128 individually addres-

sable sectors, and data can be read or written at 300K user bits

per second at the current

tandard disc rotation speed of

2.5 revolutions per second.

Kowever, the revolutions can be increased and Philips says

that data has been read and

written at six million user bits

to 500,000 A4 sized pages of alphanumeric information.

THE complex affairs of Micro-

data Corp (CW, November 9)

with the Reality business sys-

tem. Models in the Multi series

made by Intertechnique of

Vil service

r second. The 12 inch disc can hold up

sides of a single 12-inch disc using a compact significantly.

A SERIOUS challenger for existing data recording methods like tape, disc and COM holes one micron in diameter in a tellurium recording is gradually emerging from the based recording layer. The laser can then be laboratories of Philips in the form of a diode used at a lower power to read data, and the laser optical recording system. Its very high mean time at the moment of accessing a recording density should enable large particular address on the disc is 250 numbers of digitised images to be mixed on inilliseconds, although Philips is confident that this time can be reduced to about 70 The Philips system can already cram an milliseconds. The company is also sure that impressive 10,000 million bits on to the two the recording density can be increased

system compared with magnetic disc drives is that data cannot be erased after it has been written, although Philips believes that the enormous capacity of its disc should enable records to be rewritten on another part of the disc after they have been updated. The disc could provide a small business with enough space for a year's uixlating. Philips says that it is developing

software now to enable the disc to be used with commercial computer systems, although the manager of Philips Data Systems Division, Pieter de Vos, stresses that the disc will not become generally available to users for another two years at

Philips sees the laser disc as being particularly suitable for storing images, because of its huge bit capacity, and envisages it being used in the oft-discussed electronic office as an "electronic filing cabinet" holding facsimile images as well as alphanumerical information currently held on paper, microfilm and magnetic media.

Philips was provided with a head start in developing a digital laser recording disc by Video Long Play, the consumer product soon to be put on the market that uses a compact lowpowered laser to play back audio and video. The discs are pressings manufactured by Philips from masters created using special high powered laser

In producing a digital recorder that could be used with computers, Philips had the problem of developing a compact laser that could write as well as read information. The solution was provided by the company's semiconductor division which produced a diode laser dispute with another company, employing a chip measuring Pick & Associates, over owner-

only 0.1 mm square. ship of the Reality software. The chip is housed in a read/ Pick is importing Intertechnique write head that can fit in the minis from France in order to palm of a hand and which also contains all the optics for directing the beam on to the disc and the reflected beam on to signal detectors. The head, in turn, is mounted on the end of an arm that moves the head radially



Perils of core fragmentation under MVI

SEVERAL weeks ago (Op Spot, fixed number of tasks) and OS/ bit inflexible. Each time he October 19) I gave an overview MVT (multi-programming with of the IBM OS operating system. a variable number of tasks). And this week I would like to give further consideration to the characteristics of, and differences between, the two ver-

Teletype 43BKP Buffered | 64611161

Up to 20K buffer for sending,

Techtran 8400 Data Cassette

High speed search & editing

Teletype 43 Friction Feed

receiving & editing.

New for COMPEC from Peripheral Hardware Ltd.

With the former, main storage is divided into a number of fixed PARTITIONS each of which supports one job at a time.

A-J 211 Accoustic Coupler

Anadex DP 8000

Very low cost 80 col printer

The said

Widest choice of Industry Standard Products

LA180

£1700

Now MFT is, perhaps, easier

wishes to alter the way in which the PARTITIONS are set up he has to use the DEFINE command and follow a somewhat cumbersome procedure.

procedure will start first r Under MVT, PARTITIONS are replaced by INITIATORS claim, say 25K. Then a MUN which take jobs from the input queue and allocate main storage, along with other system — network goes in and out: resources, in accordance with 500K. the needs of each job. Thus the operator merely has to START and STOP INITIATORS as re-

But problems can occur under MVT, for poor operating or scheduling can cause main uses up another 400K. At storage to become "fragmented" point main storage is bet and areas of it to become unusable. This is commonly known

as "core fragmentation." To understand the root of the problem, let's consider the munner in which the INITIATOR takes jobs from the input queue and allocates main storage.

Searching from high address to low, the INITIATOR attempts to find continuous block of storage large enough to support

the job concerned. Let's take an example. It's the start of the day at an installation and the system has been loaded but no work has been started. It's a big site and so there are separate work areas for the printers and disc drives, with the card readers and tupe decks placed near, and tended by, the

main console operator. So to get things moving, the THE relationship between operators in the disc area start uing commands to MOUNT discs (the MOUNT runs as a task in storage), the staff in the printer area start some WRIT-ER procedures, which allocate printers to output classes, and the main console operator feeds ome jobs into the card reader and calls some procedures from

Philips has also developed a procedure might start addmini version of the disc mea-suring 10 cms in diameter that the next 25K. After this to ?: can hold up to 50,000 pages. Next the main consolery Microdata \$47m takeover bid

to the system and what sturted immediately. Hr. time sharing application 20K at the bottom end

begin at the highest available

next highest and so on.

address, the second tobat it:

It's possible that a William

Now, all the small job tasks, run for a comparati short time and when they i we have three packets o main storage of 50K, 60k; 2016, respectively. What it all amounts to st

shares outstanding, values the company at about \$47.2 raillion. In its year to August 31, Micro-data reported profits of \$4.1 milalthough 130K is not being jobs needing over 60k cance. run by the system. This hair lion on turnover of \$65 million. Starting out as an OEM minimaker with MAI as a major customer for its Basic Four line disruptive effect on throught. The way around this situ is to close down time shan of business systems until 1973, Microdata branched out into the und TP and re-start them. suring that they are allott storage at the top end of ra configured products market

interrupting the service to the users of the systems and with lead to complaints from the

of Technology, Lought Leicester LEII 3TU.

storage. To do this would at

AN online stock control system display units and eyestra son Computer Services, of Bristol, for EPD Services Ltd in theme of a conference wi on December 15 at Logic rough University of Technic by the Ergonomics Society Aberdeen. The system, based on a DEC PDP-11, is being used by EPD to provide a bureau service the Applied Vision Association for further information to oil companies operating under the North Sea. tact Tom Stewart, Depart of Human Sciences, Univ.

data licences. Microdata acquired CMC-UK

have taken another twist with a bad for the California minimaker last year and expressed interest company from offset litho and in acquiring CMC companies on addressing machine specialist the Continent. Addressograph-Multigraph. The bid, of one A-M share for each of Microdata's 2.3 million

CMC-UK already marketed the Microdata Reality system, and also sells the CMC 5000 series of key-to-disc systems which it builds at Hemel Hempstead and the new Microdata Royale file handling system.

Datasaab man switches

WALLY WELLS, who is pro-minent in the UK banking auto-mation scene, is leaving Data-base UK after four years to take pase UK after four years to take responsibility for marketing, administration and sales for General Automation's banking systems products in the UK.

As well as being one of the three approved suppliers of SIDs, Swift Interface devices,

transfer network, General Automation also markets a foreign exchange system called

market a system which runs a version of the software. Microdata has made no comment on the bid beyond

saying that it was under con-

'Industrial democracy only way to meet new technology'

been highlighted as the only vi-able way to meet the challenge Booth last month (CW, October of technological change in Australia in a speech by Nell Batt, the Australian Labour Party's president, who indicated that a future Labour govern- prior to the introduction of new ment would seek it as a price for technology into any organisaallowing such changes to occur

Speaking to delegates at a

INDUSTRIAL democracy has similar to those of the UK 12) when Booth stated that he believed legislation should be formulated, acknowledging the right of unions to be consulted

seminar on technology and in-dustrial democracy, in Mel-bourne, Batt showed attitudes volved in any changes; that

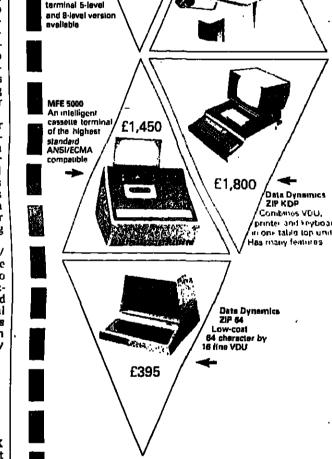
The main points of Batt's. speech were that the people

- Australia was presently experiencing "disturbing" technological changes; and that the best way to counter the negative effects of these events was the

Fast storage for DEC users

A PRODUCT which gives DEC PDP-11/70 users an alternative source of high volume, high speed subsidiary storage devices has been announced by System Industries (Europe). It is based on a special version of the Midas 9400 controller, and offers a dis-

count of up to 50% on the equivalent DEC peripherals.
One-off subsystem prices are £12,750 for an 80 Megabyte system with 11/70 cache bus interpace and RP04 emulator, and £17.450 for a 300 Megabyte version. Quantity discounts are available.



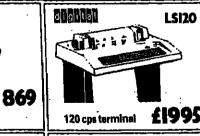
Many other items available including LA-36 DECwriters (£845), and Teletype

Required .	
ONT A DYNAMINE OF THE PORT AND THE LEAR AND THE SEARCH OF THE PORT	
	1 1 1 1
Name	
Company	1/3
Position	1 A.7
Tel. No.	
Data House Springfield Road Hayes, Middx.	易 ,~
Tel: 01-848 9781 Telex: 935429	7
Date	la l
	A D
THE PROPERTY OF THE PARTY OF TH	31
	Constitution of the last

Lear Siegler ADM 3A £595

Also ADM-1A,2, 2B

Also ASR and RO Models



OI-941 4806 Wetherby 61885 Dublin 971854







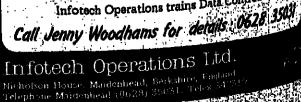
SCI 2200 cps rotary printer prints VDU











free operation.

help satisfy users and achive a smooth, trouble

Infotech Operations trains Data Controllers

NORD - the reliable system ahead of its time

A NORD is ready to grow with your work.



NORD - for a flexible future



Richard Norton (NORD) Ltd. NORD House, 17 Balle Street. London N1. Tel.: 01-2785501; telex: 299 537

Data Dynamics Group

users

Packet net

PACKET network operation

will be possible for IBM 3270

users through the 9100 series

Network Interface Processors

Telecommunications in the US. The Zilog Z80 based 9100

converts data in IBM's Binary

for 3270

European ALL HAIL, THAVE OF IFIP! director at Itel

THANK YE – AND WELCOME TO SILICON GLEN!

I SEE THE

STARTED

CURLING

SEASON'S

WELL NO, ACTUALLY, IT'S

THE FINAL TEST FOR

OUR MACRO CHIPS:

manager for advanced systems in Curran's career in computing began when he left university in the US and went as a systems programmer to Mobil, which sent him first to

AT Itel International, John Curran has been promoted to European director of marketing services. His previous job was that of marketing

Libya, then to Italy. In 1970 he left Mobil and, still in Italy, worked as a private systems consultant for large IBM users, for-ming his own company in 1975.

He joined Itel in 1977 as systems engineering manager in the Mediterranean region. His present responsibilities cover not only cleven European countries, but also Israel and the Middle East.

Mike Pegg has become manager of the London branch of Wang, with special responsibility for the VS special responsibility for the VS now Reg Broughton, who joined computer. He is replaced as Wang in January. Paddy Byrne, pre-Southern branch manager by Alan viously systems software support manager, has become marketing

Peterborough



Meet the

People







PEOPLE AND EVENTS



Michael Saver has joined Rain

Ferminals as a sales engineer for the DECwriter, Durble and Hazeltine ter-

minals and the Black Box micro. His

last job was as manufacturing pro-

Peter Gilbert, formerly branch

systems support manager for the North-West of Britain and Northern

Ireland with Burroughs, has been

appointed systems and program.

ing manager of Computer Facil-

UK support manager of Wang is

manager, has become marketing

gram controller with GEC.

Twentieth anniversarv

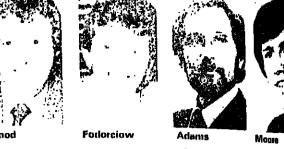
HE Conference on Data Systerns Languages (Codasyl) is to celebrate 20 years of operation with a two-day meeting in Arling ton, Virginia, next May. The focu of the meeting will be Codasyl impact on the user community which began with its initiative to develop Cobol in May, 1959.

More recently, Codesyl has been best known for its recom mendations on database manageent systems and earlier this yea taunched a new project to deve-lop a standard job control langu-age (CW, March 16).

Further information on the eating is available from Mr. Vonnie Robertson, Honeywell Information Systems, 7900 Westpark Drive, McLesn, Virginia 22102, USA.

livision of Smiths Industries. Clive Jones and Alex Ray, of Citibank, both formerly resident vice-presidents, have been promoted, respectively, to vicepresident in the personnel group and vice-president in the operating

George Clay has been appointed engineering manager of Beckman instruments. He was previously ser-



Edited by Nancy Pocock

Bob Fedorciow, previously an analyst/programmer at Sate Computing, and Alan Wood, former

viceswamager at Gen Rad, has joing Borer Electronics as a sales engine Dave Curl becomes a technical or port specialist with the same copany; previously he was moder product application engineer, we

Alan Moore has become finad controller with Memory Ireland Previously he was audit mang-with chartered accountants Coops

Rny Bareham, formerly a fic. sales manager with Ultrasone bases Systems, has become a 124. representative with Vydec, core; Hampshire, Surrey and some as: of Greater London.

New address

Plymouth 24302.

NOVEMBER 27

DIARY

NOVEMBER 19-22 Monterey, California. IOVEMBER 20

Computer languages, the way ahead, Lony Boare BCS Nottingbain branch, Chemistry Bldg, Nottingham University.

Conceptual complexity seminar, Prof., van Witingaarden, Dutversity of Manchester Computer Bldg, University of Manchester, 14,30,

NOVEMBER 20-22

Developments in distribution switch-goar, conference, IEE/IEEE/IMA, Savoy Place, London WC2, Register with IEE.

Mining, a general solution to the local

European data communications policy.

urea network problem. Dr. G. D. Calu. R.C.S. Morllog, BCS Bata Communicu-tions from Polytechnic of Central Fon-Jon, London WI, 1800. Fortable communication systems, col-loquing IERE, Royal Institution, London

WI 10.00, Registration recessary, phone 01:398:3071, ext 16. Formal specification of organisations

R. Stumper BCS Formal Aspects of Companing Science Group. Polytechnic of Central London, London Wt. 1830. A How decisions get made in managing projects, seminar Association of Project Managers, Waldorf Hotel, London WC2, 1030. Details APM, 01-799-3182.

Newspaper survival, past, present and he electronic challenge, I. Lindsay anth, IEE, Savoy Place, London WC2. Microprocessors, IEE. King Edward Grenmar School, Chelmsford, Essex.

18.00.
Array processing, M. Bayllss, BCS
Cheltenham & Glos branch, Gala Club,
Fairmile Gdns, Gloucester, 19.30.
Presidential visit, Prof Frank Summer,
BCS N Staffs branch, Clayton Lodge,
Hotel, Newcastlo-under-Lyme, 20.00.
Note change of venue.
Public data networks, D. Hebditch, BCS

Word processing, BCS Aberdeen branch, College of Commerce, Aberdeen, 1930. **NOVEMBER 21-22**

Structured systems development and quality control seminar. John Parker. BCS London branch. London SW7. Register: Christine Moulang 01-637 0471.

NOVEMBER 22

Database management systems and nformation retrieval. Elizabeth Barra-lough, Prof Peter King. BCS information Retrieval Group/Asiib Informatics Group, City University, London EC. 14.00.

14:00,
Visit to Ford Motor Co. BCS Hampshire
branch Swaything, Southampton, 14:00,
Information engineering and electronics. F. J. M. Laver. IEE/IERE: St Mary's College, Cheltenham, 19.00. Databases, 1. Draffan, BCS Teesside branch. Teesside Polytechnic, Middles-

Programming languages 1. Dr J. Larmouth J. Lucking. Polytechnic of Wales/
BCS S Wales branch. Polytechnic of Wales, Treforest. 14.15. Details (0443) 405133.

Bectronic funds transfer, the role of Bankers Automated Clearing Services. R. Hope-Smith. BCS Wolverhampton branch. The Polytechnic, Wolverhamp-

orance. The Polytochic, veovername-tor, 1830.
Visit to Manchester Computer Work-shop, BCS Manchester branch, Henging Dilch, Manchester, 19,00, Numbers limited contact R. Baker, 081-928 5471.

The use of computer graphics in televitine use of computer graphics in televi-sion, Colin Cheesman, BCS Lidinburgh branch, Mountbatter, Bdg, Herior Watt University, Edinburgh, 17.30.

Dataskil sales executive, have be

At Borer Data Systems, Roger

Adams has become sales manager.

Previously be worked for the parent

company, Borer Electronics of Swit-zerland, and before that, was a busi-

ness analyst with BOC Gases Divi-

Derek Strath, now financial con-troller of Redifon Computers, was

previously in the same position with

the AEC plant of Leyland Vehicles.

Owen Smith joins Redifon as senior

territory manager for the financial branch of central accounts, from

Olivetti where he was an account

John Burrett joins Dymo Business Systems as national sales manager,

Farrington division, from Data Card

where he was plastic card division

specialist. Ian Johnson and Neil

Widte become international sales

nagers with Dymo.

come sales executives with Sale.

NOVEMBER 22 Database management systems and Dulatiose management system in the modern temp. The about Barraelough BUS Information Rettleval Croup/Asila Informatics. Con University, London FCT 14:00 Tickets El Masino Met afferty, tel: 01:828-9361

Local Authorities Group meeting, 110M Computer Deers' Association, Town Hall, Fulbot Road, Stretford, Lanes.

NOVEMBER 24

CAD of digital electronic mea-cystomis, symposium FEC your Union Hotel, Brussels, Belgium NOVEMBER 28 Online stock recording at Perkins I is gines. British Production and Inventory Control Society, Royal Overseas League, London SWI, 1845.

Oxford: Dept of Experimental Psychology, South Parks Road, Oxford, 17-00 Details: Mrs S. M. Hockey, tel. 0805-98721.

.120ch/s

NOVEMBER 28 Computers in engineering Computers in engineering Computers in engineering Computer Computer in Computer in the Computer Computer in the Computer C The Luroner releconts network, P. 1. F. Kelly H.Rt., London School of Hygiene & Tropical Medicine, London WC 1, 17-30 An introduction to dataflow compoting, Dr. P. Osmon, BCS South West branch, Bowmoor House, Wonford Hos-

The role of large computers to future Prof Frank Sumner BCS 5: branch West Cliff Hotel, Westeld language of understanding. Dr Y. Wilks computation/Linguistics, University of

NOVEMBER 29
New technology and its effect of the property of t

Punched tape reader family-





Xerox Alto at the White House

office are in fact Alto minicomputers, and not a new product as had been supposed (CW, August 24). Since the Alto is a research machine and is now four years old, the assumption by many observers that here was the prototype of a new product about to be put on the market appears to be incorrect. The Alto was designed at Xerox's Palo Alto Research Centre specifically for use by staff there, as a

quick way of hootstrapping the firm into R&D on advanced text handling. It is a mini with a high-resolution bit map display, which means that each point on the screen corresponds to a bit in nomory. During each screen refresh cycle the memory is read and the information transferred to the screen. This gives great flexibility for graphics; character fonts and the like are controlled entirely by

text processing software has cluding the Smalltalk interactive language (CW, December 1, NEWS IN BRIEF

APPLICATIONS received so far

this year for places on university

computer science courses are

ብሜ higher than at this time last

year, according to the Univers-

ities Central Council on Admis-

sions. Engineering courses are

also more popular, with a 38%

increase. Overall, 5% more wo-

men have applied to UCCA, but

ESTABLISHMENT of a national

Japanese database covering scientific, medical, political and economic abstracts has been

proposed by the Japanese Min-

ister of Posts and Telecommunications, Yasushi Hattori.

Acknowledging Japan's weak-ness in the field, the Minister

proposes that methodology and

information retrieval software

should be acquired from one of the large US database operators like Lockheed or the Library of

IHI US timesharing bureau,

Comshare inc of Ann Arbor,

Michigan, has entered negotia-

tions with Polysar, the Canadian

government's development or-

NGR ballot likely

recognition and representation

now seeking to represent all

Takeover talks

Japan database

Popular

courses

3.6% fewer men.

SYSTEMS and programming of tractor IPS Information Process Services has moved to new officer 6D. The Crescent, Plymon's

The use of Mumps in the St. Health Service, seminar BOM of outloon firoup. London 50

Hygiene & Propical Medicarle WCI Apply Infore Novembro Country, fel Juentwood 22thers.

(specification and use of high)

Type theaton and use of mg; maney analogue/digital conser-bornium, H L. Savoy Place, logi-10/30. Register with IEF 01/28° Recourt developments in our

process control, colloquium, E Place, London WC2, 1030 Res

NOVEMBER 27-29

A great deal of sophisticated 1977). A special network, called Ethernet, has been constructed to connect all the units at PARC together, and a minimal five Megabit Ethernet is linking the two machines that have been to handle all the firm's products installed on an experimental basis in the Executive Office

Building in Washington.

vanced office systems and doing

pure research into the learning

The formation of Xerox Business Systems (CW, November 2)

that are not copier/duplicators

means that responsibility for

word processors such as the 800

and 850 has been taken away

from what was the Office Sys-

tems division in Dallas, where

development was going along

very different lines from PARC

XBS also operates Xerox

Computer Services, an all-in

bureau service that provides

both computer time and pro-

gramming for businesses, local

government and the like. It has

about 600 customers at present.

process, and the like.

and El Segundo.

Xerox would not consider selling Altos as general purpose minicomputers, if only because it has already withdrawn from the computer business with the selling of Xerox Data Systems. and has no support organisation left. To be used as part of an office system product, the Alto would have to be re-engineered and modernised considerably; it was not after all designed as a product and its components are expensive. It is microcoded to emulate a Data General Nova, which is not particularly

relevant for a product. The machine is still ostensibly secret, although it has been used by a good number of Californian schoolchildren for learning experiments, and one has been given to the University of Rochester, New York, near Xerox's

A new manager has been appointed for the prestigious Palo Alto centre. He is Robert Spinrad, who has hitherto been working in El Segundo, a suburb of Los Angeles, on the develop-ment of new products for Xerox Business Systems. He replaces George Pake, who moves on to head all of Xerox's corporate

PARC concentrates on developments that are far from the

anisation, that could lead to the **UK** launch of US firm taking a 100% holding in Comshare Ltd. the London based bureau. The UK firm is OCR scanner currently owned jointly by Polysar and Comshare Inc.

AN Intel 8080-based OCR scanner from Hendrix in the US has been launched in the UK by A BALLOT of NCR employees now looks likely after the intervention of the independent arbitration body ACAS into the bid by ASTMS to gain further recognition and representation General Audio and Data Communications of Tring, Herts, for £9,000 to £11,000, depending on interfaces.

Called the Typereader, it reads OCR-A and OCR-B typefaces within the company. ASTMS and outputs 5, 6 or 8 bit code, already has bargaining rights for NCR field engineers, but it is which can go to a paper tape punch or editing terminal for use in telex, typesetting or word processing applications.

EEC tariffs result in

dustries are having the effect of "exporting" jobs, according to the Business Equipment Trade Association. This is because raw materials and basic components are charged a higher duty than finished products, says BETA president Andy Andrews in the association's annual report.

As an example, BETA cites microcircuits which, when imported on their own from the

aported on their own from the mported on their own from the US or Fer East, pay 17% duty. Assembled printed circuit boards, on the other hand, pay 10% duty. This means it is cheaper for British firms to have their assembly done overseas consiluring na overseas, contributing

to home unemployment.

The same applies to steel, the price of which is being held high winder the Davignon Plan to protect EEC Davignon Plan to protect EEC producers, encouraging ilms in places like South Kores to send us finished products, filing cabinets and the like, so haming our own manufacturers. aming our own manufacturers.

Andrews added that a major

tronics components manufac-turers in Europe to meet our in-dustry's needs for electronic micro-circuits," requiring them to be imported against these high

BETA has been protesting about the increasing practice of local authorities of forming purchasing consortia which then impose "onerous" and "uncom-mercial" terms in their orders for aupplies. An example of this would be an authority ordering goods ostensibly for itself and then announcing that some of the goods are to be delivered to a different authority at the other end of the country. end of the country,

BETA complains that if suppilera were to band togehter in this way they would be in breach of the Restrictive Trades Prac-tices Act. However, the association reports: some progress in persuading local authorities to act more researably in this respect.



' answer to E-series

mens (CW, November 9) complement the company's nnovative new offering at the bottom end of the 7.000 series, announced earlier this year CW. June 1). This is Siemens' answer to IBM's still unannounced E-series and consists two models, the 7.708 and 7.718 shown here.

The smaller model can be field upgraded to the larger, can be handled using 33 com built in TTL technology. There are separate input-output and Algol, PL/I and Basic.

THE formidable range of new computer offerings from Sie- are built around the AMD 2901 four-bit bit-slice micro.

The machines feature an enhanced version of the BS2000 operating system, supaction and interactive proces sing as well as local and remote Mastery of 10 commands is

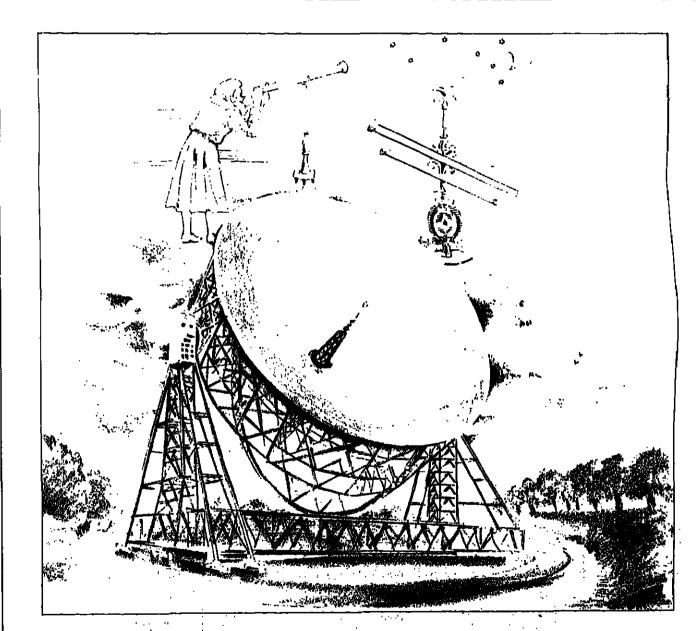
enough to make use of the system, and most application mands. Languages available include RPG, Cobol, Fortran,

Synchronous Communication format from a 3271 controller into an HDLC format bit stream

for transmission over an X25 packet network to an IBM mainframe with a 370X frontend processor running Cambridge's DMEP software. The 9100 series consists of two models. The 9101 takes input from up to four BSC lines and outputs one X25 compatible

data stream at up to 9,600 bps. It costs \$7,600. The 9102 inputs from up to 32 BSC lines, outputs up to four X25 compatible data streams at up to 56K bps and costs \$18,500. The DMEP software costs \$500.

First deliveries are scheduled for early next year, but Cambridge does not as yet have a European agent.



Success breeds success

Ours is a big name and we live up to it. Our business is growing all the time. A substantial amount of our trade is repeat business and that only comes from ' performing up to standard. Success breeds success.

Communications is one of our specialities. Whatever 'communications' means to you there is a more than an even chance that we have already supplied systems to do it. We have users with simple remote job entry terminals, we have customers using GEC 4000 computers to front-end data processing

machines, we have node processors, networks composed entirely of our hardware and networks mixing ours with others. We have multi-access and transaction operating systems and first hand. experience of packet switching.

So if you are looking into the subject make stire that one of your lirst communications is with us. Our UK Sales Manager is on 01-953 2030 ext. 3799 and our Export Manager is ext; 3478.





LAMG

John Laing Construction are building Queensgate the new regional shopping centre in the heart of Peterborough. And I'm project manager, It's got five department stores, 90 other shops bus station and parking for 2000

moved from Nottingham with my family and we're all pleased to be here. Peterborough's definitely becoming one of England's more attractive cities. John Lockwood.

Find out about Peterborough now Ring John Case 0733-68931.

Peterborough

PO Box 3 Peterborough PEI IU]

MICROPROCESSOR PRODUCTION PLANT

Edited by Martin Banks

Pitfalls that can face job-hunters in foreign parts

WORKING in Europe is fairly straightforward and presents far fewer problems than other areas. This is because applicants can more closely relate themselves to the European style of

However, Europeans usually work longer hours than we do in the UK. They start earlier in the morning and often finish later in the evening.

employers regard the UK as a place to come to recruit labour at a lower rate than they would pay their own nationals. This is. something one should be wary about. Salaries indicating many thousands of francs per week can be very misleading. The cost of living in Europe, as we all

You must have experienced all the

worries and frustrations of

sending an urgent

package abroad. Will

your goods arrive on

time? Will they arrive

safe? Will they arrive

AN INNOVATION IN

AIR FREIGHT

But now Emery Air Freight

have out an end to your freight

problems. They've introduced

the flying briefcase. It's called

the Flyte-Pak and is probably

the most efficient and inexpensive

way yet devised of sending small packages abroad.

The Flyte-Pak is a tough, cardboard container that looks

just like a briefcase. Pack in your goods, stick on a label

and give a call to Emery. Your Flyte-Pak will be rushed on

some places. In Holland and, perhaps, in Belgium you can work quite successfully just there isn't any way you are looking for people who are going to achieve a senior position unless you learn the local anguage. However, in France in West Germany you will find it very difficult indeed to. make progress without learning

I would suggest that when seeking employment anywhere in the world, you should check on the financial stability of your

Integration in every respect is the reasons for this thinking, but

"to see the family." The family Language is a problem in should be with you. Many employers would consider this a significant distraction if they felt their staff were constantly speaking English, although returning to the UK. They are

THE FLYING

Unfortunately, the British reputation for hard work has not always been obvious to Continental employers. They are becoming increasingly concerned about employing people from the UK. Whether this is justified or not I do not know. Perhaps one or two isolated incidents are

committed to working for them

land that the interest in us as a computer nation has certainly waned. Again, one must not

in Europe and this should be believe that the opportunitles in Europe are very good and in years to come, the idea of going to live permanently in lgium or in Holland, or in France, will not seem the colossal move that it perhaps appears today

One of the more interesting opportunities now available i Europe is a chance to join inabsolutely essential. Do not ex- certainly we have found in Hol- ternational companies which

IT HOLDS SO MUCH

carry anything up to 5lbs in

difficult shapes.

weight. Send samples, docu-

ments, artwork, film, records

medicines. The Flyte-Pak will

accommodate even the most

IT'S SO SECURE

Your goods are as safe

yourself, because Emery's

tight security system makes

as if you carried them

tampering impossible. And the

Emery computer has your Flyte-Pak under

AND IT COSTS SO LITTLE

You see. Emery understand your sense of urgency.

From airport to airport, the cost of the Flyte-Pak

service is only £12 to Europe and the United States.

constant surveillance.

or £15 to the rest of the world.

Your crush-proof Flyte-Pak will

have their headquarters in Bel- own, etc. whereas in Kuwaten gium, France and Holland.

By John Goldsmith

Working abroad can often be an attractive

proposition, but there are snags and pitfalk that can trap the unwary. John Goldsmith

managing director of Goldsmith Recruitment International and chairman of the CSA's

Recruitment Division, describes some of the

problems he has come across and some of the points that must be looked out for when ven-

turing into foreign fields. He has been involved

in recruiting computer people for companie and projects in most European countries, the Middle East, Africa and the US and Canada

The latter areas have been the biggest markets

The Middle East is different. In almost every facet, the local way of life is alien to what we are used to and so is the standard of living.

Do not go to the Middle East unless you have an opportunity to talk to the actual company you are going to work for. Many things can be misunderstood between agents and client and

If you feel that the lack of liquor, the often monastic existence that one has to put up with in the Middle East is not acceptable to you, then don't go. 🌰

as an applicant, you cannot afford to get things wrong.

There are many things that you have to be sure of before you go there. One of the most important, however, is that you will almost certainly need a

Many Middle Eastern countries work six days a week, their 'weekend" being on Thursday or Friday. A large number of the installations for which we have recruited only have Friday off.

It is also important to find out the quality of the accommodation one is going to be provided with, I know someone who quality of interviewing recently went to Saudi Arabia and when he arrived in Ryadh, was put in a flat with eight other people. It took him some time to achieve a more acceptable

Middle Eastern laws are very different — and if you don't obey their laws you will be in trouble. Therefore, if you feel that the lack of liquor, the often monustic existence that one has to put up with is not acceptable to you.

However, you can usually arn a lot of money that is tax then don't•go.

free and it is a way of accumulating substantial funds.

Recently we have recruited for a number of substantial and progressive Arab companies. A particular companies. A particular company in Kuwait comes to mind, where they are recruiting people in the UK on a career basis. They don't expect people to go out there for six months and then come back. They want people to go out there for a long period of time and commit themselves to working in the Middle East.

The carear connections.

The career opportunity can be extremely challenging and one is not going to suffer in any way by being out of the UK, as the hardware and systems being developed are in many cases more advanced the sufficient of the case of living in the living in the country. However, income if the country, However, income if the country, However, income if the country is also much higher, but if it is also much higher.

by being out of the UK, as the hardware and systems being developed are in many cases more advanced than some of those here.

I believe that during the next months and years, we will see many more people going to certain parts of the Middle East for long periods.

tain parts of the Middle East for long periods.

The position of the female in society there is very different. It is difficult to appreciate what this means unless one has actually been there.

The difference between, for example, Saudi Arabia and Kuwait is considerable. In Saudi Arabia a woman cannot drive her oar or go shopping on her

so far, with Europe coming second, but Gold smith expects the Middle East to offer consider erable opportunities during the next few year.

> can lead a fairly normal life. Check carefully on the fitze benefits available. You should be offered at least one hold per year with free travel to the or some other place of year choice. If you are not offered !. then I would suggest you wo. be ill-advised to go.

America is, of course, different

One is usually emigrating to

probably wrong to talk at

North America; we should to

about Canada and then it

the US. They are two very.

The quality of life in Can-

very high. The cost of bar

surprisingly, is probable very much higher than in:

country and housing is the

However, again your Cr-

employer is looking for-

month experienced at.

the UK when he can find

Canada? He is looking for

with significant technicing

perionce of some kind at

It would seem to me that

majority of Canadian com-

people are more technical if

the people in the UK. I

Canadian companies is of a

you are not acceptable to

employer, then you can be to

They do not have the

employment protection wel

and this has to be faced 1

weeks' notice would not be !

The climate in Canada is t

Bear in mind that in Canada

Why should he recn. '

thing special.

high order.

Also check to see wheth Manufactured in Fairchild's there is any support from the proprietary Isopianar Integrated education point of view &. njection Logic, the 9440 hard often can your children before vare family consists primarily of home or flown to the Milithe microprocessor itself, and a East at companies expense? single board system based on the Recruitment in Nor:

device called Spark 16.
This is a stand-alone system that comes with 4K words of memory. It has provision for a variety of firmware packages, including the Firebug debugging package, Baby Basic, and two types of PROM Autoload.

support organisation for the

thern European area, which is

managed from the company's

IK beadquarters at Potters Bar

hy Peter Turner. Similar organ-

sations are being planned for

the central and southern

Euronean areas.

MICRO NEWS

imminent hardware additions include a range of support pircuits, such as the 9441 memory controller and the 9442

Series of seminars

MICROPROCESSOR Develop nent Systems is the title of the first in a series of one-day semi-nars to be run by the National Computing Centre. The aim is to provide information about de-velopments and methods of application of microscopics.

plication of micros.

Speakers at the first event, to be held on November 30 at the NCC's Manchester headquarters, include Dr Martin Healey from University College, Cardiff, and Vincent Tseng from ICL Dataskii. Cost of the semi-nar is 644 Par in £44.

Future titles planned for the series include 16-bit micro-processors, interfacing, and storage technology. Further information can be obtained from the NCC at Oxford Road, Manchester M1 7ED.

The £350,000 will be used to I/O bus controller, and a twoset up a separate marketing and board microcomputer system, called Flame 16. 9440 family to cover the Nor-

16-bit microprocessor family. Though first unveiled in the US by the company nearly two years ago

(CW, January 13, 1977), the device has only now been formally introduced on to the UK marketnlace.

The delay, according to chief technical officer Tom Longo, has been due in part to a long development

programme for software for the part. This was released earlier this year as FIRE, the Fairchild Integrated Real Time Executive. The part was originally developed as an emulator for the Data General Nova minicomputer, and has since become the subject of both suit and counter suit between the two

Fairchild puts £350,000

into UK marketing

of 9440 16-bit family

companies. It is still, according to Longo, compatible with the Data General equipment.

tem uses Fairchild's macrologic micro-programmed CPU memory control logic, memory parity logic, memory mapping logic and I/O bus converter circuitry.

Memory capacity is 32K words, equally split between the two boards of the system, and this total can be quadrupled by replacing the 4K RAMs with -compatible 16K devices.

Next June should also see the introduction of the 9445 microprocessor. Also a 16-bit part, it will have a compatible instruction set to the 9440, and will add facilities for on-chip hardware multiply and divide, extended addressing up to 64K words. a self-test capability, and stack manipulation, making it compatible with the Nova 3 nicomputer.

Longo says that it should offer factor of four performance improvement over the 9440, operating at the same 10MHz clock rate. He added that this figure was in fact likely to be greater, for the 9445 was being designed to operate at around

Both the Spark 16 and Flame 16 systems can be fitted into a packaged system called Focus 16. This is a chassis and front panel package intended primarily for the OEM market.

The FIRE software already available includes such pack ages as Fireload. Fire diagnostics and Firebug, and is comple-mented with both the baby Basic and a full business Basic. Ševeral additions are in development, including a floppy disc operating ANSI Fortran 77 and Pascal high level languages. These compilers should be available about March.

Multi-user Basic offer to micro system builders

SOFTWARE supporting multi-user commercial Basic on major intel and Zilog microprocessors is being offered to micro system builders by Panatan Transport builders by Panatec Inc. a soft- Four internal data types, exware house based in Orange, tensive string handling capabil-

ware includes a tim sharing operating system, an Extended Hasic language processor, and a comprehensive file management steel 10,000 plus a royalty on each system. All the software runs on the Intel 8080 and 8085, and the Zilog Z80, and is currently being adapted for the Intel 8086.

Three manufacturers — Applied Data Communication.

Applied Data Communication, central Southampton was Micro V. and Sord - have ulready been licensed to incorporate the software in their sys-

tems, according to Panated.
With a year's field testing at over 50 sites, the firm is now prepared to market the system nationwide and worldwide," said a spokesman.

it supports three file organ- directly.

ities, and Cobol-like facilities for ed Pana/Basic, the soft- data Item editing are further significant features. Pana/Basic is typically

opened last week by Xitan Sys-The company, which has been

in business for over a year, is an authorised dealer for both Commodore, with the Pet system, and Comart, which is UK distributor for Cromemco, Sol and Targeted at commercial applications. Pana/Basic is notable play in the shop, together with examples of the info 2000 floppy. disc subsystem for \$100 bus systems, which Xitan is importing

oard microcomputer system, alled Flame 16. This Nova 3 compatible system uses Fairabild's proposed for the system of the system

board computer family based on the 8086, 16-bit microprocessor has been announced by Intel.

The board, known as the iSBC 86/12, follows the lead set by the other members of the system family by being compatible with

expansion boards that make up the SBC range.

With software development loaded to the SBC86/12 for full company, provides the first supported by the Intellec Series execution and debug

8-bit and 16-bit microcomputers to be introduced concurrent with the SBC 86/12 is the iSBC Supporting a 1M byte address 957

"Reject this batch of chips . . . They're crinkle cut!"

space, the new board can be configured with the full range of execution package which per-This is an interface and mits software modules develoned on an intellec to be down.

the board are accommodated by an expansion of the Multibus structure to support 20 bits of address and 16 bits of data.

The memory capacity of the hoard includes 32K bytes of dual port dynamic read/write memory, together with sockets for up to 16K bytes of ROM.



And we mean today's. The 745 is available immediately. Just fill in the coupon and send it now. TEXAS INSTRUMENTS LAP LIMITED European Digital Systems Division.
Data Terminal Marketing, MS33A,
Manton Lane, Bedford MK417PA, Tel, 0234 67466, Telex: 82178 Stockport Tel: 061 442 8448 Slough Tel: 07.53 35545

Company Address ___

and send trnow. SILENT 700

Portablé Data Terminal rademark of Texas Instruments's







Today's*

Branch office of the future, but available now - that's the Model 745 Portable, from the "Silent 700" series of electronic data terminals. It gives representatives immediate access to computerised data

wherever there's a telephone and power point. iust plug it in, link it to a 'phone handset and the 745 is ready to send or receive up-to-the-minute data. You can then make instant decisions based on reliable, accurate information.

In your customers' offices, for instance, the 745 can enter sales orders or print out complete reports in

seconds on your stock, delivery times, prices or detailed You can buy the 745 at attractive prices, or use our flexible leasing programme. And you can depend on

responsive support from TI's national sales force with additional back-up from its distributor, Ti Supply, to handle small quantity immediate deliveries. : The 745 means

change to greater efficiency and profit Learn more. Call the

First UK customer

handprint system

using handprinted characters as a vohicle for data entry via optical

character reading systems, Scandats, the OCR systems manufec-

turer, has officially announced its AlphaNumeric handprint system

Widening gaps in the pay scales between the private and public sectors of months. So far, the claim has not sucthe computer industry recently spurred the Society of Civil and Public puty general secretary of the SCPS Servants into action. It has put in a claim for increased computer staff

allowances - the second within 12 ceeded, but as Campbell Christie, deexplains, his union is ready to fight, as he tells Robin Webster.

MAJOR government computer projects, both operational and under development, are faced

In a bid to stem the current flow of staff, the SCPS put from £150 after one year's service. £300 after two years and

deputy general secretary of the SCPS explains, government pay restrictions have proved an insurmountable barrier.

"The Civil Service Department has given us a negative "and this is due to the present incomes policy. We are now seeking a senior level meeting with them at which we will continue to press for these increases. There can be no com-

"This latest claim has been lodged because we want to arrest the wastage of computer. people from the Civil Service. mainly to the private sector

"The drain came about because, since 1975, Civil Service pay has been negotiated rigidly within the government's guidelines, so we have had exactly what is allowable. Obviously, this hasn't been the position within the computer industry in general - they have found

MAJOR government computer projects, both operational and under development, are faced with the threat of being run down or indefinitely shelved if scenarios being discussed within the Society of Civil and Public Servants about the effects of trained Civil Service computer personnel leaving to work in the private sector become a reality. Why Civil Service Service Service Service Service Service Service Computer personnel leaving to work in the private sector become a reality. the 8,000 programmers, systems analysts and operations supervisors it represents. The claim sought to lift the scales from £150 after one wearlest. vice, £300 after two years and £800 after three years, to £250, £500 and £1,000 respectively. But as Campbell Christie, deputy general secretary of the

for various posts.

"The result is that Civil Service pay rates are not competitive. They are not competitive generally, and they are not competitive in the computer area. It is brought to a head more dramatically in the computer area of the Civil Service because these people have a skill that is immediately marketable outside."

However, despite the guidelines, the SCPS has made many efforts to win better wages for its members.
"We didn't think govern-

ment policies were a way to resolve the country's economic problems," said Christie, "but as part of the TUC we were duty bound to go along with the agreement that there was for a time between the TUC and the government. When the TUC broke away from the

campaign for a proper pay settlement and in support of this we took strike action last November. We were not successful, so we were forced to settle, because everybody else was settling, for a Stage 3 increase only. Even with that, we were beginning to recognise that our computer staff rates were particularly out of

improved. We didn't specify the amount of improvement we wanted." Extra money was awarded, but only in the form of the third level of £600 which was added to the then two-level

"In fact, others in the Civil Service had to have a bit less in order to provide for that," said

Christie, "There was about 0.5% of the wages bill available for consolidation and additional things and although this did go partly to computer staff, we then said that it was not adequate to arrest the decline in trained computer staff that we were experiencing."

Actual wastage levels recorded by the SCPS and CSD show that turnover is high.
"The two sources show that line, so we lodged a claim at the beginning of this year asking wastage has grown so much

that their allowances be that in the last figures that we have, for the quarter ending June this year, the wastage With the growth of

demand in computing generally in the Civil Service, allowance structure of £150 the Civil Services are

rate for programmers and syslems analysts was running roughly at an annual rate of 20%. That dropped a bit in August, but the indication rom our branches is that it is picking up again and accelerating. So the prospect is that if it accelerates through this winter and into spring, we will have to run on through to the winter of 1980 before anything can be done due to the rigid application of incomes xilicy limiting us to a 5% increase. With the growth of demand in computing generally in the Civil Service, ie prospects are horrendous.

The potential seriousness of he situation can be highighted by the fact that many of the 8,000 SCPS computer staff are deployed in essential areas within the Ministry of

"The Civil Service is the biggest single employer of omputer staff in the country. and the Ministry of Defence is the biggest of the departments staff. So the effect of staff iosses is significant on the MoD," explained Christie.

Apart from unclassified work like the processing of pay data for the armed forces, were any classified projects at risk?

"There are people working on projects essential to the defence of this country, eplied Christie. "But that i only one element of it . . . the growing additional element is that the whole range of government departments that ise computers is at risk. The

Weish order

AGAINST competition from CL, Data General and Olivettl. Burroughs is to supply a 128K B1825 processor to Montgomery District Council, Powys. The system will have 130 Mbytes of disc storage, two in-house Bur-roughs TD 8317 terminals and two others, a TD 511 and AP 320. at remote locations



CHRISTIE . . . "we want to arrest the wastage of

Inland Revenue department

for example, is developing two

major computer projects: one

which is due to go live fairly

soon is the collection of all tax

and the other, still in its early

stages, is the computerisation

of PAYE. But perhaps more

immediately significant is

keeping mounted projects that

are now running. The develop-

ment of computer systems for

the payment of pensions and

child benefits are two expan-

ding areas that may run into

difficulty if we can't keep up

the required level of mainte-

nance.
"The nonsense is that the

people who have to run these

and other government projects

are having to do so with their

hands tied behind their bucks

because the staff they train,

when trained, don't find Civil

Service pay attractive because

it is artificially held back, and so they leave. That puts pro-

The further complication to

the situation was that "We are

fixed with the classic dilemma

of Civil Service management,

those who have to deliver ser-

vices to the public, saying that

we should do something about

this, while the managers of the

country's economy, who are also in the Civil Service, are

saying that we need to have an

incomes policy and as govern-

ment we must enforce that

policy absolutely.

jects at risk."

Sweeping up debit

NEWS IN BRIEF

Councils sign

with Datasaa

CONTRACTS for Datasati financial terminal equipment worth £225,000, have her signed by five local authoritis. The largest is with the Sefter Metropolitan District Sefter Sefter

Metropolitan District Council

which has ordered four DS/N

processors, each with half a

Mbyte of disc storage, 14 cashir workstations and five remote

terminal adaptors.
Each of Sefton's D5/20s wi

be connected to an ICL 19037 g

Bootle town hall and applications will include rent and rate

payments against any funding.
The other four authorities as

Sedgefield District Council

Chester City Council, Adur Da

trict Council and the Valed

A COMPUTERISED instalment debt control service developed by Management Computing Services specifically for make furniture outlets, and not operated by Centre-file, is being used by furniture and carpa retailers, D.B. Furnishers of Pontefract. The system provide retailers with a weekly list of the accounts, including arrear. account status, action to be : taken on bad payers, and n analysis of arrears levels.

Switch to software INVESTMENT in computer

research and development x Honeywell is running at an at nual rate of \$200 million acces ing to chairman and the executive Edson Spencer. Premphasis is switching tout software and minicomp tems, an area in which #:well is doing particular, Further acquisitions are plant where they would fill gaps Honeywell's technology, acc. ding to Spencer.

Provident 'first'

ONE of the first UK installations to use NCR's Virtual Resource Executive operating system is the Provident Mutual Life Association, which has replaced its NCR 201 with an NCR V857 system to handle the expansion of its insurance business. The new system valued at \$412,000 consists of a 840K processor with 1.2 Mbytes of disc storage and a 3,000 lpm printer.

CASTELL

Management and Financial Consultants in Information Technology

VENTURE CAPITAL EQUITY FINANCE

DOES YOUR COMPANY REQUIRE DEVELOPMENT FINANCE? ARE YOU A PROPRIETOR WISHING TO REALISE CAPITAL? DO YOU NEED FUNDS TO OBTAIN OR RETAIN CONTROL?

My clients have risk capital available in amounts of the £500,000 to sound and well-managed companies where the cipals may wish to raise funds to finance growth, retain controls management, or realise cash.

Capital is provided by authorised sale of new or assume equity, or both, on an Over-The-Counter Market hasis benefits of long-term risk capital and a private flotation few of the usual disadvantages of selling equity. I am seeking New Technology-based Firms who pan dame

—products or services, capable of future develop -management and communing technical awareness
-market, continuing market awareness and new

Call me. Dr. Stephen Castell on 0621 891776. Or Willed

CASTELLI COMPUTER & SYSTEMS c/o Box No. 1998

LETTERS TO THE EDITOR

'Fallacious reasons' why Basic for AlphaNumeric is popular on small systems

sons (CW. October 26) why Basic is popular on small systems. While accepting that the reasons stated are in agreement with popular wisdom, I feel that they are largely fallacious, depending in part on the common failure to distinguish between the Basic language and the operating system in which it is generally embedded. To conbook updating, issuing cast receipts and the recording of

sider the reasons in detail.

IN a letter headed "Why IBM

presumes too much" (CW,

October 26), Professor Barron

discusses the statement in the

IBM advertisement, "No com-

puter will ever be able to take

decisions based on intuition".

Even a professor would be bold

in proclaiming his certainty that

such a statement was false, and

Professor Barron is prudent. But

there is a strong implication that

he believes computers will one

One asks whether the basis for

this belief is a careful study of

the inherent limitations of pro-

grammability; or is it rather an

(intuitive) technological

optimism, an unwillingness to

accept any limitations on the

functions that computers can

Either way, Professor Barron

is imprudent enough to risk an

analysis of human intuition.

Presumably there is an elabo-

rate process of associative

carching". For what it may be worth, I

can report that my intuition does not tell me that my intui-

sing Management was happy that Bernard Allen in Op Spot CW, October 26), should pick

up our changes which will allow

operations staff with appro-

printe experience to join our

fear our intentions may not be

clearly understood as instanced

by Bernard when he writes that

the people who work day and

night in the computer room en-vironment are left out" and that IDPM "should start by talking to

operators about the problems

they face in relation to training,

shift work and career progres-

If operators are left out it will

be only to the same extent that

programmers and even analysts with less than a required level of experience will be left out. No

one has suggested to us that we

should lower our entry require-

ments and allow anybody to

lact, we have just raised the

thiry requirements, not to make

ourselves more exclusive, but in

order to be representative of the

increased level of professional skills now present in the in-

dustry.
What we have done is to say
that for the first time we will
that for the first time we will

accept operator experience

s not a club. In

ofessional ranks. However, I

day intuit.

perform?

would be desirable to keep production programs in compiled form. Similarly any other language can be interpreted, so Basic's alleged advantage in being interpreted is largely a reflection of the software that hardware producers have provided.

2. Basic has some very un-English-like features which I. It is true that Basic is hinder comprehension. It is the

tion works like that. The state-

ment seems dangerously close

to the reductionist one that in-

tuition is nothing but an elabo-

rate process of associative

searching - from which we can

be invited to conclude that the

advent of large-scale associative

storage will enable us to simu-

He proposes a Turing-like

by a computer, and if a human

being cannot tell whether the

puter or by a human being using

intuition, then the computer can

be said to have used intuition. To

me, this variation on Turing's

test is even less convincing than

Suppose Professor Barron pro-

grammed his computer to prefix

all its outputs with a statement

about the class of process it had

employed in their production.

One could readily accept

messages starting · for example)

"I have computed", "I infer", "I

an analyst will get appropriate

credit for the operating ex-

perience. The value placed or

the credit will be different it

gained on a large 370 as distinct from a small System 3. Should

the applicant have stayed in

operations and reached a posi-

tion of responsibility, then our

evaluation based on years and

months x type of experience may qualify for direct entry to a

I believe that IDPM has

already demonstrated its wish to

junction with Computer

Weekly, especially for operators

It was standing room only. But

surely what we must do is not

just talk to operators. We have

to arrange a constant dialogue

We can provide the opportul

ities. We have a very real inter-

est in the problems of the opera-

tors. We are especially inter

ested in their career progression.

But in order to do something

about these things, the opera-

EDWARD G. CLUFF.

Secretary General

tors have to come forward.

between operators and DPMs.

talk to operators as witnessed by a recent meeting of our Central London branch, held in con-

professional grade.

detect", "I have retrieved"

May I propose a counter-test?

the original.

It's up to operators

THE Institute of Data Proces- an operator, then two years as a

decision was made by a com

Barron presume too much?

A computer's 'intuition'

pilers do exist; in passing, it instead of TOTAL, and it forces some peculiar constructions. 1 would be very surprised to hear my wife say "If it is not raining, ignore my next statement. Remember vour umbreila". Yet this is the structural conivalent

80 IF X>=0 THEN 100 90 LET X=-X

described by Dr Stevens, others are not. Also debugging facilities of this type can be, and are. provided for other languages -- eg Mantis on DEC10. There are What possible programming languages such as Joss and its derivatives, and also APL and the statement "I intuit"? By the way, both Professor POP2, which are inherently fully interactive. This, however, is not Barron and IBM might like to tell me in what sense computers a consequence of the design of may be said to take decisions.

Thames Polytechnic, London SE18 late intuition. Does Professor York University

COLIN TULLY

problems of stretching a design out of shape, should they properly be called Basic? How far would the language have to change to be called Algo!?

There would also be no bar to providing Basic-like editing facilities for other languages.

J. A. T. MADDISON

3. While some Basic systems are fully interactive in the way

to be stored and corrected while the source documents are still It has also announced that its first customer in the UK is Lloyd's being scanned.
Bank, which has installed a sys-Bank, which has installed a system to handle payroll applications, and that further systems are to go to the National West-princeter and Midland Banks.

Previously, anily high-musility.

By-passing the delays associated with online correction of rejected characters, the system

features an offline Scanplex 1 VDU that allows such characters

symbols + ./. - . and \cdot .

minater and Midland Banks.

Previouely, only high-quality printed numeric characters, with a tew special letters, were usable of AlphaNumeric handprint, Scandata OCR acanning systems, but with OCR acanning systems, but by using a flying spot scanner that lion and training centre at Hounsbyusing a flying spot scanner that lion, where a Scandata 2250 OCR system and a Cummins Keyscan 1,280 video elements, the Scandata system can handle numbers

White House installs hotel system

FOLLOWING the London Penta hotel (CW, July 6), the 600-room White House Hotel in London, owned by Rank Hotels, is to install the Computerised Hotel Accounting and Management Processing System from Marcol Computer Services. Based on a twin Data General Eclipse S130 system, the Champs system handles all reservation and accounting applications.

INFOTECH STATE OF THE ART REPORTS "The only independent publishing project devoted exclusively to a regular exhaustive analysis of the state of the art in computing" Sfluctured Analysis and Design Future Networks ■ System Reliability and Integrity Future Programming vinis Versus Maintrames Data Base Technology Microcomputer Systems Individual Reports available at \$225 (£120) Special subscription price for all eight Reports \$1275 (£690) Please send me your tree 28 page prospectus

Return to: Infotech International Limited

England Telephone (0628) 35031 Telex 847319

Nicholson House, Maldenhead, Berkshire SL6 1LD.

THE CASE 3 in 1 -== 三天 r ---

when evaluating an applicant. An applicant with two years as Bureau service dropped

From front page and Midas, Motor Industry

ilers' Accounting System. IBM says that these packages are no longer being developed but that all commitments with respect to them made to cusomers before July 31 when IBM topped actively selling the Packages will be honoured. The itments cover areas like

program maintenance. RBP is run on a 370/168 a are both still being actively marketed. The other machine at Warwick, a 370/158; rups Ter-

IBM's new bureau centre in Warwick, along with IBM's RJE and TSO services, The latter two minal Business System, TBS, for transaction processing and reporting.

7200 Speed upgradeable Please send me more details about the CASE: Automatic equalisation 450 modem series LSI design Outstanding dial-up performance.

COMPLITER AND SYSTEMS
ENGINEERING LIMITED
Woodcock Hill Estate Harefield Road
Rickmansworth Herte WD3 1PL England
Telephone Rickmansworth 76699
CASE Telex 923325

Jelephone)

Participative systems design

Involve all staff in the diagnosis of their own efficiency

sign means giving the user a the choice of final system solumajor part to play in the design of his own computer system and Th of the network of roles, relationships and tasks that surround the technical system.

When a new computer system is being introduced into a clerical or shop floor department the approach used by the authors is to create a design group consisting of representatives of all functions and grades of staff staff in the department in the tems management and senior

The professional systems analysts are also members of the design group and their role is to give advice on how the computer can assist the achievement of efficiency and job satisfaction objectives, and to design the technical part of the system when this is agreed.

In addition to the design group, a steering group of senior trade union officials is also

provide the design group with top management and union sanction and assistance, and to act as advisers if the design group becomes anxious that a particular system solution may not be in line with company

policy.
This approach may sound difficult or even impossible. The authors have now been able to use it in six different kinds of organisation and the results have been excellent — good computer systems, liked by the

associated with well designed jobs which provide interest and

> The first task for a design group of this kind is to take responsibility for making an accurate diagnosis of user needs. These will include present job satisfaction and efficiency needs, and an assessment of fu-

ture needs and priorities. With participative systems lesign an increase in job satisfaction is always a system objective. Because the design group has no experience of

doing this kind of analysis, and is organised and jobs and the intention is to use the whole department as diagnosticians, the authors have developed a number of simple tools that can be taught without difficulty to design groups and their departmental colleagues.

Part 2—By Frank Land

The failure of systems designers to include the views of a users in their design specifications was a feature of a BCS users in their design specifications was a resture of a BCS survey of DP user requirements. In an effort to overcome this type of criticism, a technique of participative systems that type are content by three specialists in communications.

this type of criticism, a technique or participative systems design has been croated by three specialists in computer and systems management: Enid Mumford, of the Manchester Business School; Frank Land, senior lecturer is computers and systems analysis at the London School of Computers and Lohn Hawgood, director of the computers and Lohn Hawgood.

Economics; and John Hawgood, director of the computer laboratory at Durham University. Their technique has now

laboratory at Durnam University. It air technique has now been implemented at a number of user sites, and in a specially commissioned series of five articles, Mumfad, Land and Hawgood will describe their methods, drawing on

their implementation experiences of the technique.

The first article, last week, was by Enid Mumford, This week Frank Land (pictured left) writes on design groups and

These are: . A method for identifying efficiency needs and problems called "variance analysis" because it focuses on weaknesses in the existing system;
2. A method for identifying job

satisfaction needs - "job satisfaction" analysis; and

3. A method for identifying significant opportunities and development goals -- "future

VARIANCE ANALYSIS consists of identifying all the weak inks in the way the tasks of a department are carried out prior to the change. This includes aspects of work where co-ordination is difficult, and where errors either occur frequently or occur infrequently but are difficult and expensive to correct.

All staff in a department are usually_expert in these problem areas. They have been trying to get something done about them for years. They can all be involved in documenting the nature of each problem, where it originates, where it shows up. where and how it is controlled, and in suggesting how it could be avoided or more effectively controlled in the future, assisted by the new computer system.

JOB SATISFACTION is defined as the "fit" between what an individual or group is seeking from the work situation and what they are receiving from it.

This is something that can be measured provided job satisfaction can be successfully defined. The authors see it as being achieved when five sets of needs are met in the work situation.

These are knowledge needs, used participative systems sign the kinds of variance have been identified have needs, task methods and ethical needs. The following kinds of questions which are asked through questionnaires and small group discussions will help identify these needs:

system are usually at lists.
boundary, where it in the with the outside works with Knowledge needs — to what extent does the existing organisation of work meet oyee needs for work that employee needs for work confully uses, and helps develop,

their skills and knowledge;
2. Psychological needs — to
what extent does the existing organisation of work meet the needs of the employee for responsibility, a sense of achievenent, status and recognition;

3. Efficiency needs — to what provide employees with the support services and control system that assist their efficiency;

4. Task needs — to what extent does the way in which work

50th Faraday

signed meet employee need; skilled and challenging was

5. Ethical needs - to al. extent does managements. employees in the way they they should be treated para larly in respect of communication, consultation and inval ment in decision taking?

design group has to (a); the kinds of changes tr.

occur over the expectal".

discussed in our next cool

In the firms where we

very different, but their lo

The most vulnerable

lesser extent, between

If greater control calk

In the same way, job

tion needs have pro

want work that yariety, challenge a variety, challenge di opportunity to use di and develop their owa yarietistics les

tions. Most em

ed over these variable

The design group distant pitals had installed small batch the answers to these quest processing computers and were with all staff in the depart. exploring their value, regional in small groups and the c. hospital boards were using small important job satisfacion: batch processing computers for their financial systems and the are identified. FUTURE ANALYS Ministry of Health had initiated attempts to identify the met its experimental computer pro-

gramme to explore real time computer systems in health the department in the future e extent to which it is like he subjected to major da Although there have been Change may be a result of many surprises along the way, many of the things discussed and proposed at that time are demands from customen. technical possibilities t management or tres now operational in a few cenattitudes, new legislaticum tres, and the challenge of the many other factors. present is that of spreading the benefits of the few prototype In order to design as: which will meet the need future as well as of the per

systems across the Health Service as production model sys-The Medical Specialist Groups

of the British Computer Society

were formed towards the end of

the Sixties, at a time when a

number of doctors, scientists,

nurses and administrators and

computer professionals had be-

gun to see some of the possibil-

health care environment.

ies opened by computers in the

A number of teaching hos-

groups based in Scotland, Northern England (Manchester) The Specialist Groups have and Southern England (Lonbeen involved with the medical

BCS SPECIALIST GROUPS — LIVING WITH COMPUTING

The British Computer Society's specialist groups are organising a conference in London from January 4 to 6, called BCS 79, Living With Computing. In this series of articles, the

work of the specialist groups and their BCS 79 plans are described. This week the focus

is on the medical groups in an article by the groups' chairman, Dr Barry Barber.

Power and potential

of computers in

medical profession

Each group operates differently, according to its geo-graphy and membership. The Scottish group prefers one-day meetings, the Northern group arranges ad hoc meetings and the Southern group has a programme of evening half-day and one-day meetings. The total mailing list is about 800, many of whom are not members of the BCS, but are interested doctors, nurses, administrators and scientists who pay a nominal fee

One of the major objectives of the groups is the mutual educaprofessionals in the power and potential of computer systems good practice in their myself implementation. The groups provide an open forum for discussion of the multitude of ments are interesting. One is the related matters concerned with computer system design and implementation from technical aspects of computer hardware. care field. operating systems and data-

user education, privacy and

computing committee of IFIP(TC4) and were a founding member of the European Federation for Medical Infor-So far the biggest enterprise of the Medical Specialist Groups was the running of the first Federation Congress, Medical Informatics Europe MIE 78, in Cambridge this September, Over

420 delegates attended a very successful meeting. The opening speakers were Professor Maurice Wilkes and Sir Douglas Black, president of the Royal College of Physicians, David Ennals, Secretary of State for tion of computer and health care the Social Services, spoke at the dinner and the proceedings are already available from Springer and developing guidelines for Verlag (56 DM) or direct from As well as the more specific

changes, two general developgreater involvement of the nursing profession in the development of computing in the health

The second major develop-

ness that the various manage ment services disciplines represent facets of a single activity. The word informatics, a specifically non-English word used by few British computer professionals but by most in ternational English speaking computer professionals, embraces all aspects of this

To launch these activities, the Medical Specialist Groups of the BCS set up a UK co-ordinating committee to provide a nationa view for meetings of the Council of the European Federation for Medical Informatics and to promote and co-ordinate national

BCS 79 will provide an oppor tunity to see some aspects of medical computing within the context of the other BCS specialist groups. Officers of the BCS Medical

Specialist Groups will be glad to provide information on their activities, the work of the European Federation and the planning for Medical Informatics Berlin which is due to be held in Berlin from September 17 to 20, 1979. They may be con tacted through the BCS

Valuable survey of computer companies operating in UK

A SURVEY of computer companies operating in the UK sub-sidiaries of companies head-quartered in Continental Europe Company Comparisons. Called Computer Data Processing Equipment', it is the fruit of a diligant search through the files. diligent search through the files of 174 companies at Companies blished in. House, and consists of company name, and two years' turnover, assets, liabilities, before-tax the companies listed in the sur-

fact that the most recent figures those to the end of 1976.

The most noteworthy point brought out is that it is by no at the back of the report. means easy to make money in the UK computer market. Of the 174 companies listed, 53 reported a loss in the last year for which they lodged figures at the Dack of the report.

*Computer Data Processing Equipment, first edition, costs £29.80 from Mrs Hart at Inter Company Comparisons Ltd, 81 City Road, London ECIY 1BD. Telephone 01-253 9736.

Since the data is all historic, it

would be unfair to name any of rofit and payments to directors. vey. There are not many obvious The usefulness of the survey is omissions, although two to some extent limited by the important ones are Univac (or Sperry Rand) and Olivetti. for most of the companies are Companies which have not submitted accounts since 1974 or 1975 are excluded, but are listed

Butlin's orders Nova

Transaction Processing System quick implementation. software from DCC International, a devision of the Data Com- Memac launch munications Corporation of Memphis, Tennessee.

One system will be installed at each of the eight Butlin's holiday centres in the UK and will enable staff to respond within 24

duce more management statis-

The reservations system, nicknamed Octobus, has been is £2.450.

TO help speed its booking proc- designed and developed by Rank customers, Butlin's has placed a a screen formatter. Cobol pro-£400,000 order for eight Data gramming language, and an General Nova 3 systems, with automatic job scheduler for

A RANGE of IBM-compatible floppy disc subsystems has been introduced to the UK by Memed Systems. The FTO500 series is supplied without drives, or with hours to customer inquirles about accommodation and reservation dates.

Butlin's is also hoping to prodouble-sided. This gives a maximum capacity of 2.5 Megabytes. Price of a basic two-drive system

bases to the system aspects of ment is the increasing awarehow flexible the syster Because change can c predicted with any he accuracy within a fairly time horizon, the plant MORE AND MORE COMPUTER PEOPLE These three technique variance analysis, job ssil. Lion analysis and future and provide the design group diagnostic information at enables it to set human, at istrative and technical ch ARE TAKING THEIR WORK HOME WITH THEM. tives as a preliminary tosys design. How objective ar-and benefits assessed with

Des. Res. with all Mod. Cons. could soon include a Home Computer.

Read about 'Computer Lib' in OMNI. You can buy a domestic computer for as little as £300. But did the computer Industry prepare for drastic change as the humans. Computers are now helping us to decode price of computers fell? Did any big companies get ready for this change? You bet they didn't.

Bionic Inflation: The Eight Million Dollar Man. Read 'The Real Bionic Man' in OMNI. The University of Utah has already gone one step beyond the Six Million Dollar Man.

They've just spent over eight million dollars on blo-engineering. And achieved some remarkable

The Future Shock author asks: Are we living in the future now?

Read the Alvin Toffler interview in OMNI. What kind of society are we creating? A new society? Or merely an extended larger-than-life version of our present society?

Toffler has other ideas.

Dolphin Talk - can we fathom it out? Read 'Communicating with Dolphins' in OMNI. Dolphins are known to make certain sounds in

the presence of humans. And only in the presence of Dolphin talk into language we can understand.

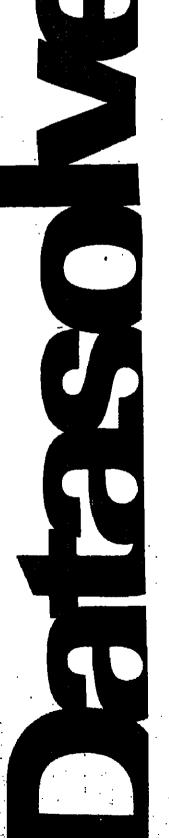
If you were the last whale, you would sing a sad

Read 'Whale Song' by Leigh Kennedy in OMNI. The whale had felt the danger for weeks, tasting man-ness and potential death in the water.

He'd called and called for others. This season he heard nothing. I am lost, I am alone.



TOMORROW'S MAGAZINE TODAY



BM370 and 303X users...

Here's your through-ticket to MVS

MVS is tomorrow's direction. That's the IBM line. It's great to arrive but it can be a fearsome journey if you travel alone. We should know. We were first in Europe.

Since Datasolve came to MVS four years ago we've been the navigators for dozens of other companies who wanted to travel

Helping them gain MVS experience on our large IBM and Amdahl computers before letting them strike off on their own Allowing them to build up MVS momentum to a point where their own operation could take over.

Giving them expert technical assistance, comprehensive MVS training and the benefit of our special MVS services like TSO3, the interactive program development aid to conversion.

Datasolve will help you plan and administer your MVS itinerary with the understanding, experience and cost-effectiveness that only Britain's most seasoned MVS travellers can provide. Whatever your route to MVS, Datasolve is just the ticket.



BOC Datasolve Limited

Datasolve House 99 Staines Road West Sunbury-on-Thames

50th Faraday Lecture of the Institution of Electrical Engineers were given in Swansea earlier this month.

Entitled The Diagnostic Electron, the lecture is an overview of the use of electronics in medical diagnosis. It was written by a team of six specialists from EMI, who will take turns.

Lecture



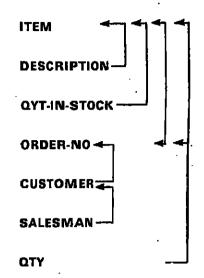
It translates source programs into re-locatable object modules that can be linked

The LPA11-K costs £5,265 and the DR11-B,

RELATIONAL DATABASES

IN Part 3 a technique for constructing fourth normal form (FNF) files was presented. This week we will use the technique to construct FNF files from the brewery example given in Part 1. The advantages of FNF files will be discussed and we will go on to show how relationships between files can be represented

Relationship diagram. The relationship diagram for our brewery



From this diagram it can be seen that: ITEM is a direct key for DESCRIPTION and for QTY-IN-STOCK. ORDER-NO. is a direct key for CUSTOMER. CUSTOMER is a direct key for SALESMAN.

A concatenation of ITEM and ORDER-NO. is a direct key for

By slashing disk space needs

seven different ways, some of

CA-DYNAM/D paid for itself

as much space as is actually

needed ... and does it auto-

Two: it automatically

releases unused space. Three:

it allows all partitions to share

secondary space. Six; it allows

sequential files to be deleted

Seven: the DYNVTOC display

automatically after closing.

any one work area. Four: it

limits fragmentation of disk

volumes. <u>Five</u> ; it allocates

in less than three months.

our clients calculate that

Here's how I One: CA-DYNAM/D allocates only

matically.

Application of the technique described in Part 3 results in the following breakdown of the relationship diagram into four FNF

ORDER-NO DESCRIPTION QTY QTY-IN-STOCK CUSTOMER ORDER-NO

The underlined data items are prime keys; in the second file, ITEM and ORDER-NO together form a concatenated key. Figure 2 shows details of each of these files.

CUSTOMER

SALESMAN

The n-to-n relationship between ITEM and ORDER-NO does not result in a fifth file (which would be built in Step 4 of the process) because ITEM and ORDER-NO together form a concatenated key for QTY (and would thus be selected in Step 1).

Normalisation. The conventional file shown in Figure 1, Part 1, could have been decomposed into the four FNF files in Figure 2 by a process different from that described in Part 3. This alternati process is called normalisation, and it consists of reducing the conventional file to first normal form, then to second normal form, to third normal form and finally to fourth normal form.

The results of the two processes are the same and readers who have followed this series will have no trouble in understanding any of the standard texts on the subject.

A disadvantage of normalisation is that a conventional file needs to be designed before it is normalised. If the conventional file already exists, fine; if not, it must be designed. The relationhip diagram method can be used on a collection of data items which have not yet been formed into files.

Advantages of Fourth Normal Form files. FNF files have several advantages over their conventional equivalents. These advantages are illustrated by examples which compare the FNF files in Figure 2 with the conventional file in Figure 1, Part 1.

Plus Other Benefits

CA-DYNÁM/D.

benefits you realise with

Valuable disk space savings is only one of several other

For example, you can count

surable increase in throughput.

Aborted or bypassed jobs are

eliminated. Programmer pro-

ductivity goes up because

there's no longer any need

to map disk file addresses

too, is improved.

or keep track of file size or

CA-DYNAM/D has a number

Disk Space and Catalog Mana-

other attributes. File security,

of other features that help

make it the fastest selling

on an immediate and mea-



Max Stewart's safeting relational databases, Kit pands on the technique constructing fourth May form file, FNF, and gove to show how relationing between files as a represented Stewantes, isional technical separates of Living Vehicles, the community vehicle sector of BL.

This is the fourth ping!

Addition. If a salesman finds a new customer, this customs identity cannot be added to the conventional file units! customer places an order. It can, however, be added to Fig. Figure 2 together with the name of the salesman.

Undate. If customer Spuman is allocated to another salsmuj is necessary to update three occurrences within two records the conventional file but only one occurrence within one no in File d. If instead, salesman Joe is replaced, it is necessary undate two occurrences within two records in the convents. file, but only one occurrence within one record in Filed

Deletion. If ITEM Bung ceases to be stocked, all references CUSTOMER Fuddle and SALESMAN Jim vanish in theco: tional file, but not in the set of FNF files. Note that Jimis Full. local salesman irrespective of what items Fuddle orders.

Efficiency. FNF files have fixed length records (le no repair groups). Fixed length records can be handled more efficient both hardware and software than can variable length mont; software can be simpler, and the packing density (on dist)hit: higher. Note, however, that our aim up to now has been to me a logically sound file structure which is implementating

Ease of Use. FNF files can be represented by tables; const. files with repeating groups cannot. Tables are readily under by non-programmers

By Max Stewart Part 4

There are no hidden and unsuspected relationships between data items in FNF files. Data items in a file, which do not form part of a candidate key are unrelated, unless there is a multiple relationship. This will be described later in this series.

Relationships between Files. When files have been designed using the inter-item relationship diagram (the formal name for the type of relationship diagram used up to now), the inter-file relation-ship diagram can be drawn. This shows the relationship between the keys (which may be concatenated keys) of different files.

Another example of inter-item relationships is shown in this

Notes	Item	Relationship
School roll no	PUPIL	4747
Long text field	PUPIL-DETAI	LS-
Subject names are unique	SUBJECT	4
Long text field	SUBJECT-DE	TAILS-
Mark value	MARK	
Examiner no	EXAMINER	

One pupil does not sit the same subject twice, and an examiner may mark papers in several subjects. Examiners marking popular subjects may share the workload with other examiners. The corresponding FNF files are:

PUPIL-DETAILS SUBJECT SUBJECT-DETAILS PUPIL, SUBJECT MARK EXAMINER

where the prime keys for each file are underlined.

The corresponding inter-file relationship diagram is:

Relationship Pupil file PUPIL Subject file SUBJECT Mark file PUPIL, SUBJECT

The Pupil file is related to the Mark file on PUPIL (the school roll number), and the Subject file is related to the Mark file on SUBJECT (subject name).

Summary. Let us summarise what has been achieved so far. We have defined keys, dependency, candidate keys and FNF files; shown how to draw an inter-item relationship diagram; presented a technique for producing FNF files from this relationship diagram; and shown how to construct an inter-file relationship

diagram.
Part 5 will discuss some aspects of implementing a system of

File a										
ITEM Keg Bung Tep	DESCRIPTION Steel Steel Brass	QTY-IN-STOCK 300 10,000 300								

File b										
ORDER-NO 1 2 3 4 6 7	CUSTOMER Grotny Spumson Eversoft Crudgington Fuddle Spumson Grotny									

	File c		
ITEM	ORDER-NO	QTY.	· ·
Keg Keg Keg Bung Bung Tap Tap Tap	1 3 4 5 2 4 6 7	12 20 6 1,000 500 20 10 30	
	File d		

	:		File	d	7.70					
CUSTOMER			٠.	SA	LES	M/	١N		1.25	
Grotny Spuman			÷.,	Jos			,			
Eversoft Crudgington Fuddle			:	Jaci Jaci Jaci	k 🖖					
Figure 2		1		Jim		10 è		480		

of 75 inches per second, data densities of either 800 or 1,600 bits per inch, and a data transfer rate of 120,000 chps. The nine-track slave drive version of the subsystem 1,024K bytes. Its use raises the maximum Two new direct memory access intermemory size from two to eight Megabytes. A one Megabyte increment now costs faces have also been announced. The LPA11-K system transfers data at an costs £9,923.

utilities.

DEC announces real time boost for VAX-11/780

HARDWARE and software enhancements for the VAX-11/780 have been announced ment of operating systems, compilers, second, and can be used either in single second, and can be used either in single

by DEC to help users with their real time scientific and process control applications.

run-time system components, database user mode or for the control of up to eight systems, communications software and experiments simultaneously. The DRII-B

The BLISS compiler costs £12,000 to buy,

or the whole system can be licensed for

AN order processing, stock control, and accounting system de-CONSUMER buying guides will signed for operation by inexform a substantial part of Baric's 8,000 page Prestel Information perienced users has been introduced by Gamma, and will have its first public showing at the Compec exhibition which begins Provider service, and Baric has signed up its first major customer for 400 pages. The cuson December 5 at Olympia. Called Salespac, it is based on tomer is Comet Radiovision Digital Equipment hardware, Services, the electrical goods discount house. Baric will pre-

Konica Cameras.

and Gamma's first customer for

latest goods and prices. Comet will pay £10,000 for the first year to reach Prestel sub-

pare the pages, updating some of

hem weekly to show Comet's

First major

customer

Two of the new products, an improved

semiconductor memory and the BLISS-32

high level systems implementation langu-

age, have already been announced in the US (CW, October 5).

The new memory uses 16K bit chips and

is available in increments of 256K, 512K and

place with Gamma on the possibility of adding a word pro-cessing capability for mailing purposes, and purchase/ nominal ledger and budget forecasting facilities are to be provided later.

Salespac debut at Compec exhibition

A typical small Salespac sys-tem would consist of a DEC 320 the system is Konishiroku UK, the Feltham-based branch of processor, two VDUs and a line printer, and this would cost about £21,000, while a large sys-tem, based on a PDP-11/70, The Konishiroku system uses a DEC Datasystem 354 to handle order entry, order processing, could support up to 32 VDUs. HQ in The Hague.

stock control, management and cost about £120,000.

system is a 16-bit parallel interface for

The other new product is the TU45 tape

subsystem, which has a read/write speed

reporting and sales ledger appli-cations. Talks are also taking Dibol and can be run under either the CTS 300 or CTS 500 operating systems, costs £5,000

200th Filetab sale

WITH an order from the insurance company, Equity and Law, the NCC has chalked up 200 overseas sales of its Filetab file maintenance and report generator package. Equity and Law

Are you legal, decen honest and truthful?

Advertisers have to b The Advertising Standards Author

Anouncine Hereline Hazeltine announces its newest and lowest-price addition to the Leadership Line of Economy Terminals, a worthy companion to the famous Hazeltine 1500 series. • Effectively apply advanced microprocessor technology to advanced microprocessor technology to Effectively apply advanced microprocessor technology to action advanced microprocessor technology to action and action and action and action action and action Meet the growing needs of the min microcomputer video terminal marks or our distributors NOW for immediate action

Contact us

Hazejtine Litnited, Terminel House, 14 Petershein Fload, Richmond, Sutrey, TW2 5BR Tet. 01-048 3 111 Telex: 928572

Mediande Billing Neothride Ltd., Childredie Road, Northeinpton NN 58U, Tel. No. Northeinpton 21811. Telex: 31504.

Bootland: Forward (File Ltd., Dordinate Industrial Estate, Duplembrie, FN 6V1) 8-W 196. No. Deligity Bay 12312. Telex: 727433.

B.B. England: Richmond Richmond Reprinted Billion WC21 Bres Tel. NO. 01-858 4583. Telex: 28483. 2.

N.W. England: Sportable Office Supplies. 290/27 | Deligit Northein Colling and Hardy Mitscheller Tel. No. 06-681 0767. Telex: 587161;

[Neithird: Richmond Compliant Richmond Compliant Reprint House, Advanta Reprint Dubin 2, Industry Reprinted Billion State 22. Telex: 5121;

S. W. England: General Compliant Richmond Compliant Reprinted Advance Place Westingham, Sprintshirp Rich. 10. No. 0734.791384 (Belax & Pasid).

See it at Compec 78-Stands E27/F2

call me, I'm interested in knowing more about CA-DYNAM/D Company

and various disk space utiligement System sold today. It's available to you entirely without obligation for a 30-day trial_evaluation. Just call us or send the coupon today! **COMPUTER ASSOCIATES** David Tory, Computer Associate (U.K.) Ltd. Park House, Park Street Maldenhead, Berke. Tel. (0528) 30315

CA-DYNAM/D

Disk space and catalog management system for DOS, DOS/VS users

Like adding more disk drives ... for free!

sation reports help optimise

Disk space savings alone

running anywhere from four

That adds up to a lot of

extra disk drive capacity you

when you really need to add

you how much savings are

period of time. After that,

required for CA-DYNAM/D to

amortise itself within a given

We have a chart that shows

can use to put off the day

can easily run up as high as 40% in the average IBM centre

Up To 40% Disk Space

use of devices.

disk drives on up.

more drives.

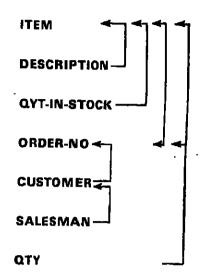
it's pure profit l

Savings

RELATIONAL DATABASES

IN Part 3 a technique for constructing fourth normal form (FNF) files was presented. This week we will use the technique to construct FNF files from the brewery example given in Part I. The advantages of FNF files will be discussed and we will go on to show how relationships between files can be represente

Relationship diagram. The relationship diagram for our brewery



From this diagram it can be seen that: ITEM is a direct key for DESCRIPTION and for QTY-IN-STOCK. ORDER-NO. is a direct key for CUSTOMER.

CUSTOMER is a direct key for SALESMAN.
A concatenation of ITEM and ORDER-NO. is a direct key for

Application of the technique described in Part 3 results in the following breakdown of the relationship diagram into four FNF

ITEM

DESCRIPTION ORDER-NO

QTY-IN-STOCK

QTY

CUSTOMER

ORDER-NO

SALESMAN CUSTOMER

The underlined data items are prime keys; in the second file, ITEM and ORDER-NO together form a concatenated key. Figure 2 shows details of each of these files.

The n-to-n relationship between ITEM and ORDER-NO does not result in a fifth file (which would be built in Step 4 of the process) because ITEM and ORDER-NO together form a concatenated key for QTY (and would thus be selected in Step 1).

Normalisation. The conventional file shown in Figure 1, Part 1, could have been decomposed into the four FNF files in Figure 2 by a process different from that described in Part 3. This alternative process is called normalisation, and it consists of reducing the conventional file to first normal form, then to second normal form, to third normal form and finally to fourth normal form.

The results of the two processes are the same and readers who have followed this series will have no trouble in understanding any of the standard texts on the subject.

A disadvantage of normalisation is that a conventional file needs to be designed before it is normalised. If the conventional file already exists, fine; if not, it must be designed. The relationship diagram method can be used on a collection of data items which have not yet been formed into files.

Advantages of Fourth Normal Form files. FNF files have several advantages over their conventional equivalents. These advantages are illustrated by examples which compare the FNF files in Figure 2 with the conventional file in Figure 1, Part 1.



This is the fourth party.
Max Stewart's series in the development and in the development and in the development. relational databases, ki pands on the technique constructing fourth beat form file, FNF, and took to show how relationing between files cas is represented. Stewarké-is ional technical upparanager for Lybrid Vehicias, the communication of the communication o Vehicles, the community vehicle sector of BL.

Addition. If a salesman finds a new customer, this customer, identity cannot be added to the conventional file units customer places an order. It can, however, be added to Field Figure 2 together with the name of the salesman.

Update. If customer Spuman is allocated to another salesme, is necessary to update three occurrences within two recognitions the conventional file but only one occurrence within one to in File d. If instead, salesman Joe is replaced, it is necessary update two occurrences within two records in the conventor. file, but only one occurrence within one record in Filed.

Deletion. If ITEM Bung ceases to be stocked, all references CUSTOMER Fuddle and SALESMAN Jim vanish in the cong tional file, but not in the set of FNF files. Note that Jimis Fulf. local salesman irrespective of what items Fuddle orders.

Efficiency. FNF files have fixed length records (le no repor-groups). Fixed length records can be handled more efficient. both hardware and software than can variable length rooms software can be simpler, and the packing density (on disc)side higher. Note, however, that our aim up to now has been tons a logically sound file structure which is implementation is

Ease of Use. FNF files can be represented by tables; conventing files with repeating groups cannot. Tables are readily undered by non-programmers.

Are you

honest and

Advertisers have to be

The Advertising Standards

legal, decent truthful?

By Max Stewart

There are no hidden and unsuspected relationships between data Items in FNF files. Data items in a file, which do not form part of a candidate key are unrelated, unless there is a multiple relationship. This will be described later in this series.

Part 4

Relationships between Files. When files have been designed using the inter-item relationship diagram (the formal name for the type of relationship diagram used up to now), the inter-file relation-ship diagram can be drawn. This shows the relationship between the keys (which may be concatenated keys) of different files.

Another example of inter-item relationships is shown in this

Notes	Item Relationship	p
School roll no	PUPIL	4
Long text field	PUPIL-DETAILS	
Subject names are unique	SUBJECT -	+
Long text field	SUBJECT-DETAILS-	
Mark value	MARK	
Examiner no	EXAMINER	

One pupil does not sit the same subject twice, and an examiner may mark papers in several subjects. Examiners marking popular subjects may share the workload with other examiners. The

PUPIL-DETAILS SUBJECT-DETAILS **SUBJECT** PUPIL, SUBJECT **MARK EXAMINER**

where the prime keys for each file are underlined.

The corresponding inter-file relationship diagram is:

Notes	<u>Ke</u> y	Relationship
Pupil file	PUPIL	▼
Subject file	SUBJECT	◄
Mark file	PUPIL, SU	BJECT

The Pupil file is related to the Mark file on PUPIL (the school roll number), and the Subject file is related to the Mark file on SUBJECT (subject name).

Summary. Let us summarise what has been achieved so far. We have defined keys, dependency, candidate keys and FNF files; shown how to draw an inter-item relationship diagram; presented a technique for producing FNF files from this relationship diagram; and shown how to construct an inter-file relationship

diagram.
Part 5 will discuss some aspects of implementing a system of

ITEM	DESC	RIPTION	QTY-IN-STOCK				
Keg Bung Tap	s	teel teel rass	300 10,000 300				
		File	b				
ORDER-NO		CI					

	File c		
ITEM	ORDER-NO	QTY	
Keg Keg Keg	1	12	
Keg	2 3	20	
Bung Bung	ł <u>4</u>	1,000	
Tap Tap	5 2	500 20	
Tap	4	10	
Tap	6 7	30 60	

		A.			1	 - :
	- 7	File	đ.			
CUSTOMER	T		SAI	ESN	IAN	 . • . •
Grotny Spuman		:	Joe			
Eversoft Crudgington Fuddie			Jack Jack Jack			
Floring	<u> </u>		Jim	17:14		

DEC announces real time boost for VAX-11/780

HARDWARE and software enhancements for the VAX-11/780 have been announced by DEC to help users with their real time scientific and process control applications. Two of the new products, an improved semiconductor memory and the BLISS-32 high level systems implementation language, have already been announced in the for execution

US (CW, October 5). The new memory uses 16K bit chips and is available in increments of 256K, 512K and 1,024K bytes. Its use raises the maximum memory size from two to eight Megabytes. A one Megabyte increment now costs

BLISS-32 is intended for the develop- aggregate rate of over 100,000 samples run-time system components, database systems, communications software and

It translates source programs into relocatable object modules that can be linked The BLISS compiler costs £12,000 to buy, or the whole system can be licensed for

Two new direct memory access interfaces have also been announced. The LPA11-K system transfers data at an costs £9,923.

ment of operating systems, compilers, second, and can be used either in single user mode or for the control of up to eight experiments simultaneously. The DRII-B system is a 16-bit parallel interface for applications requiring higher data rates. The LPA11-K costs £5,265 and the DR11-B,

The other new product is the TU45 tape subsystem, which has a read/write speed of 75 inches per second, data densities of either 800 or 1,600 bits per inch, and a data transfer rate of 120,000 chps. The ninetrack slave drive version of the subsystem

First major **customer**

CONSUMER buying guides will form a substantial part of Baric's 8,000 page Prestel Information Provider service, and Baric has signed up its first major customer for 400 pages. The customer is Comet Radiovision Services, the electrical goods discount house. Baric will prepare the pages, updating some of them weekly to show Comet's

latest goods and prices. Comet will pay £10,000 for the first year to reach Prestel sub-

AN order processing, stock constock control, management and cost about £120,000. rol, and accounting system designed for operation by inexperienced users has been introduced by Gamma, and will have its first public showing at the Compec exhibition which begins on December 5 at Olympia. Called Salespac, it is based on

forecasting facilities are to be Digital Equipment hardware, and Gamma's first customer for the system is Konishiroku UK, tem would consist of a DEC 320 the Feltham-based branch of processor, two VDUs and a line Konica Cameras. printer, and this would cost

The Konishiroku system uses about £21,000, while a large system. DEC Datasystem 354 to handle tem, based on a PDP-11/70, order entry, order processing, could support up to 32 VDUs

reporting and sales ledger appli-cations. Talks are also taking Dibol and can be run under place with Gamma on the either the CTS 300 or CTS 500 possibility of adding a word prooperating systems, costs £5,000 cessing capability for mailing purposes, and purchase/ nominal ledger and budget

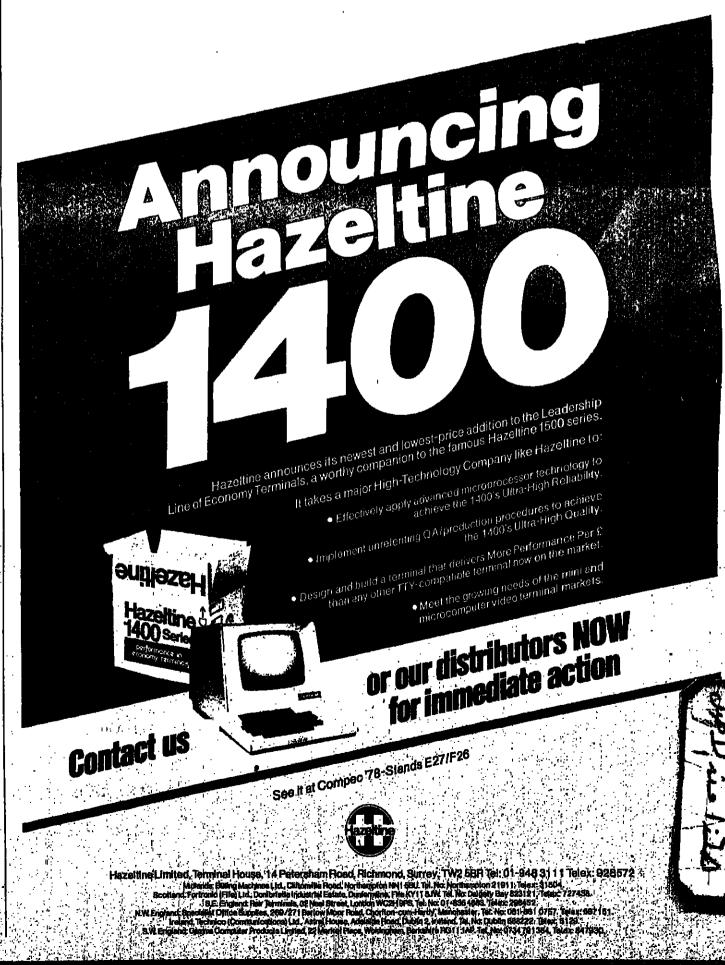
Salespac debut at Compec exhibition

A typical small Salespac sys-

200th Filetab sale

WITH an order from the insurance company, Equity and Law, the NCC has chalked up 200 overseas sales of its Filetab file maintenance and report generator package. Equity and Law will use the software at its Dutch HQ in The Hague.

Software, which is written in



CA-DYNAM/D Disk space and catalog management system for DOS, DOS/VS users

Like adding more disk drives ... for free!

By slashing disk space needs seven different ways, some of our clients calculate that CA-DYNAM/D paid for itself in less than three months.

Here's how I One: CA-DYNAM/D allocates only as much space as is actually needed ... and does it automatically.

Two: it automatically releases unused space. Three: it allows all partitions to share any one work area. Four: it limits fragmentation of disk volumes. Five: it allocates secondary space. Six: it allows sequential files to be deleted automatically after closing. Seven: the DYNVTOC display and various disk space utilisation reports help optimise use of devices.

Up To 40% Disk Space Savings

Disk space savings alone can easily run up as high as 40% in the average IBM centre running anywhere from four disk drives on up.

That adds up to a lot of extra disk drive capacity you can use to put off the day when you really need to add

We have a chart that shows you how much savings are required for CA-DYNAM/D to amortise itself within a given period of time. After that,

it's pure profit l

C1 Please call me, I'm interested in knowing more about CA-DYNAM/D Compan Address Telephone (area code

Plus Other Benefits

Valuable disk space savings is only one of several other benefits you realise with CA-DYNÁM/D.

For example, you can count on an immediate and measurable increase in throughput. Aborted or bypassed jobs are eliminated. Programmer productivity goes up because there's no longer any need to map disk file addresses - or keep track of file size or other attributes. File security, too, is improved...

CA-DYNAM/D has a number of other features that help make it the fastest selling. Disk Space and Catalog Management System sold today.

It's available to you entirely without obligation for a 30-day trial evaluation. Just call us or send the coupon today!

COMPUTER ASSOCIATES

David Tory (U.K.) Ltd,

he New British nanulacturer of low cost £645 one of End User) high quality igh specification /DU Terminals

rel: 01-452 0490



RUBIDE

Take away Tallys from £1600

Contact either BRUCE CANE or JAMES WICKES on 01-658 5906.

> ACCOUNTANCY 4 COMPUTER PERSONNE

ALL COMPUTER STAFF

CONTRACT & PERMANENT FOR A PERSONAL SERVICE **CALL 638 9841**

FOR SALE

IBM 5496

DATA RECORDER

with IBM Certificate of

Maintenance.

OFFERS TO D.P.M.

Bourns (Trimpot)

Hillend, Fife

(0383) 823221

Hewlett Packard

9825A for sale

All ROMS

As new

01-637 0777

Nelson Computer Services Ltd.

URGENTLY REQUIRE

Univac VIP'S and VP'B

Tel. 07062 29125

COMPUTERS

BOUGHT

AND SOLD

E O B EQUIPMENT LTD.

Tel. 0783-293818

Telex 537763

FOR SALE OR

LEASE (Subject to continuing availability and contract.)

IBM 370/158 - III IBM 370/158 CPU (U34)

Two (2) Megabytes ISC — 3350 Available: April '79 4-year Lease £13.860/month Selling Price: £545,000.

IBM 370/148

BM 370/148 CPU Two (2) Megabytes ISC — 3350 Available: end Feb. '79. 4-year Lease £9,800/month Selling Price: £395,000

IBM 1403 - NO1 Printer 3-Year Lease £410/month IBM 2821 - 002 Control Unit 3-Year Lease £350/month IBM 2501 - BO2 Card Reader 3-Year Lease £170/month. All available on Short Delivery

COMMUNICATIONS

IBM 3272/2 Control Unit IBM 3277/2x6 Display Selling Price: £16,800.

ALSO 370/135 CPU. Immediate

TELEPHONE:

PREMIER COMPUTERS on 01-940 1134 or TELEX THEM

on 926734 NOW!

Paul Harrison tional Children's Home 85 Highbury Park London N5 1UD 01-226 2033 we'll do the job'

5.000 children who need love

Please contact

Fungus is mushrooming everywhere

Genuine Dec items and compatibles available, immediate ex-stock deliveries, enormous savings. Installation and maintenance contracts arranged on all products. Why not let us quote you?



COMPUTER PRODUCTS LIMITED 16 ALBION STREET, CASTLEFORD, W.YORKS.WF10 1EW TELEPHONE: (STD 0977) 550111 / 550577 TELEX: 557644

am TASK FORCE

Computer Consultancy Services

The very best operators, programmers, analysts and consultants are available for assignment in UK and abroad. We have creamed the best skill and experience from the contract market - we have a strong management team responsible for the performance of each individual and the success of each project - we have established a stable work force and can offer much more continuity because of our service to contractor

Task force your opportunity

We are Computer Contract agency with a difference.

We can give you more cash, more jobs and more benefits: this is how it works:

We will pay you very competitive rates and give you regular work. You don't pay PAYE because you will be a limited company; this gives YOU control of your tax payments.

We will solve your administration headaches, your company set-up, book-keeping, invoicing, account and tax returns will be done for you, by professionals as a free

Registration for VAT benefits you on all your inputs. We, of course, administrate all the accounts.

As a limited company you can move a leased car arrangement (tex-free payments), which we can provide and organise for favourable terms.

We can get you insured against long-term sickness and set-up a pension plan. Long-term service qualifies you for

End-of-contract bonus scheme and retainer deals can be necotiated.

We are only interested in good relevant experienced;

contracts available immediately are: Operators, IBM, ICL, Honeywell, all areas, from £160 pw North analysts and consultants £300 pw

Honeywell programmers £250 pw Midlands ICL file tab £300 pw IBM Systems programmer OS/VS, CICS and power 'GIVE US THE . . . tools, food, clothing, heating — all cost money, but all are ICL/IBM conversion Cobol programmers £350 pw nvolved in caring for childre Honeywell Cobol£250 pw South IBM Cobol If you give us — not tools — bu Honeywell Cobol/IDS your computer waste, we can do the job of caring for over ICL new range from £250 pw Europe operating System Designers Munich

care and security. £600—various Systems/programmers, OS, MVS/VS1 £350-£550 pw **CAN YOU HELP?** These and many other contracts will be forthcoming; so i

you are the best, give us a ring:

am TASK FORCE LTD., 630/634 London Road Southend-on-Sea, Essex, SSO 9HW Tel: 0702-331400

PDP11704 and 11734 Systems and Peripherals (

Also various Refurbished PDP8 and 11 Systems, and Modules from stock.

> PDP-81 8k Fully Refurbished, £1,200. S.K. SYSTEMS LTD. Stevenage Road, Hitchin, Herts. Tel: (0462) 35267

** SEPTEMBER OFFER **

WANTED

Telex: 826715 S.K. SYS.

IBM SYSTEM 3/15

International Company requires an IBM system 3/15 preferable Model B for its operation in SWEDEN

Please contact JOHN ARNUTT at Port Glasgow (0475) 41631

LOOK AT THE GROWN

Our Market Place (cature (today on page 20 – 21) enables you to reach a vast 82,000 circulation of whom no less list 91% personally request their copies. No wonder wealing more display advertising than any other computer journal 35% of all computer ads appear in our pages - and Market Place is the most cost-effective of all for leasing, 2nd hard hardware, maintenance services, wholesale goods and contract staff ... The rates are:

> 3.35 s.c.c. £9.35 36-98 s.c.c. £7.70 99 s.c.c. and over £6.05

Series discounts: 7-5%, 13-10%, 26-15%, 52-20%

If you are interested in a particular article/special Feature or advertisement published in this issue of

COMPUTER WEEKLY

why not take advantage of our reprint service. Reprints can be secured at reasonable cost to your own specifications providing an attractive and value able addition to your promotional material. order 250)

For further details contact Brian Bannister, IPC Electrical-Electronic Pross III the form below.

To Brian Bannister, Reprints Departments Dorset House, Stamford Street, London, SE l am interested in advertisement headed

COMPUTER WEEKLY

Address

Please send me Company,



WEBSTER D/P SERVICES **ELECTRONIC BROKERS LTD**

PRINTERS & TERMINALS,

ENTRONICS MATRIX PRINTER MODEL 101A 65 characters per second, 132 print positions adjustable paper width 4 to 14% Verital Format Control 9 & 7 dot matrix Parallel Interface 64 ASCII character set £950

ELETYPE MODEL 33 INPUT/ OUTPUT TERMINALS

IAZELTINE VISUAL DISPLAY UNITS SUPER SAVINGS ON MASSIVE

BULK PURCHASE Taletype Compatible 12" Diagonal Screen TTY Format Keyboard 64 ASCII Character Set

ONLY £350 5 x 7 Dot Matrix witch-selectable H-2000A 26 lines of 74 characters, with direct Transmission Speeds up to 9600 baud

Switch-selectable Parity ONLY £495 Standard CCITT V.24

MINI COMPUTER EXCHANGE BIG SAVINGS ON OUR LARGE STOCKS

F DEC PROCESSORS, PERIPHERALS, ADD-ON MEMORY, OPTION MODULES AND RACK CABINETS. £2,500

PDP 11/04 Processors with MOS of CORE Memoryin BK and 15K Increments AS NEW CONDITION OTHER CPUS CURRENTLY IN STOCK

DB-On MEMORY
MITER Core stack with backplane (11/15, 11/20)
MITER Core stack (11/05 11/10)
MITER BA DORS stack (11/05 11/40)
MITER BA DORS stack (11/04 11/35 11/40)
FILIP 16K Parity Core stack with backplane (11/35 11/40)
STIFF BK MOS (11/04 11/34)
STIFF BK MOS (11/04 11/34)

POPS SERIES
Large stock of CPUA — PDPSE, PDPSM, PDPSI, PDPSI,
PLUS ADD ON MEMORY AND WIDE RANGE OF OPTION MODULES
ALL AT GREATLY REDUCED PRICES) NEW CATALOGUE NOW AVAILABLE

Cur trading conditions can be supplied on request

ELECTRONIC BROKERS LIMITED

49-53 Pancras Road, London NW1 2QB

FOR USED DP EQUIPMENT **BUY OR SELL THROUGH**

NEW DE LUXE 80 COLUMN HAND PUNCHES (EX-STOCK)



WEBSTER D/P SERVICES LTD. 65 WIDMORE ROAD, BROMLEY KENT BRI 3AA

★ OPERATORS ★ ★ PROGRAMMERS ★ **★ PUNCH OPERATORS ★**

> **LEADING SUPPLIERS OF CONTRACT OPERATIONS** PERSONNEL THROUGHOUT EUROPE

SAVE TIME AND MONEY CALL US FIRST

LONDON 01-493 5736/8 MANCHESTER 061-833 9343 OON STREET, LOND

CoOperators supply first-rate contract operations staff for long or short term needs RING 01.836 841



SYSTEMS

D.T.C. Taskmaster and Microfile system available with up to 4 ports, 4 £3,780 floppy discs, 64K addressable memory 10 MB hard disc available from

D.T.C. 382 and 302/T Hyterm printer. CALL US Application Software single and multi-FOR A user turnkey business and word-FOR A processing systems. QUOTATION

168 FINCHLEY ROAD, LONDON NW3 6HP **TELEPHONE: 01-794 0202**

Jpgrading?



New Systems? Weekend Overtime? Program Maint.? Sickness?

Holidays?

Systems — Programming — Operations

Downgrading? Peak Work Loads?

When you need Contract people, Computer Two Thousand will make your life easier.

Contract Operator, Data Prep. Programmer/Analyst Staff

We have completed over \$1000 long and short items, contains a coupling of the programs thousand Europe, while this targest compares services a large symbol Datasolve a behind on our as the name you can trust.



Finight Computer Services Limited, 14 Old Park Lane, London W1

Company interested in currently available

COBOL based software packages

for applications involving sales order, stock control, ledger etc. to run on D G compatible micro computer based system.

Write for full details to: Box No.: 1997.

cember IBM 370/125 GF2 available immediately IBM 3345 Data Modules availab

Ring Mike Williams 01-778 2006 PANDEX (COMPUTER SERVICES) LTD.

WANTED

Used Disc Packs

DATA SERVICES HAVERING LTD.

80 column card and magnetic tape, 1600 B.P.I. Main office Mag. tape

01-593 5474

rreb 56218

Large volume work our speciality. Dally workloads welcomed. Collection and delivery service. Competitive prices.

DATA PREPARATION & BUREAU SERVICES 3742 Key to Disk - pick-up and delivery service specialising in all

IBM System 32 — hands on testing avail. Provides extended services on data prep — RPG Compiling — Data

Contact Ron Davies for further details: MOSLO SYSTEMS LTD., 01-602 5568 201 Holland Park Ave., London W11 4UN

WANTED over 100 units/

- TICKET PRINTERS — CASH DRAWERS to be connected to LSI-11. SABCO, av. G. Smith 38 Colmer-Berg, Luxembo

FITIS

computer services limited

CONTRACT or PERMANENT---ANALYSTS - PROGRAMMERS - OPERATORS PUNCH OPERATORS DATA CONTROLLERS

Tel. 01-487 5781 28A Devonshire Street - Loridon - W1



Total DP Support at Itabea Programming:Operating Data Preparation & stem Data Control Tacan

Contract & Permanen recruitmen





When the industrial action at Her Majesty's Stationery Office is over, the report of the Data **Protection Committee** will be published, although its main conclusions are likely to be those outlined in the leaked report (see page

In this article, written before he had seen news of the likely contents of the DPC report, director general of the Computing Services Association Alan Benjamin suggests that we should go back to examining the issues involved from first prin-

Privacy: Let's go back to first principles

tion of the individual from the corporate entities). invasion of his privacy is a comone which is of interest chiefly in those countries where free discussion of the issue is possible.

Data protection can, however, be a powerful tool for liberty and personal freedom in ways which are wider than those associated just with the individual.

Like all new phenomena, it has its possibilities for abuse and some of these are now visible and affect the use of computing. which is why I am concerned.

Although we cannot yet know mittee has said to the Home Secretary, we can guess that it has wrestled with some of the issues which have been reflected

people find the subject of moment) contain data on

Realisation of the possibilities plex legal and social issue and for misuse of data deliberately or accidentally, caused the whole movement of individual privacy protection to start.

It was thought that computers heightened these possibilities. and those concerned with the liberty of the individual found the computer a convenient target. The computer was little understood, and for that reason feared, and it was overwhelmingly used by the establish-

The late Kenneth Younger, in what the Data Protection Com- the report of his commission's work, and other researchers found no evidence that computers offered increased dangers, only that the use of in legislation and draft regula- computers posed different protions in other countries. These blems from those set by the use concern the licensing or regist- of manilla envelopes or loose

privacy confusing. Protec- "natural persons" (as opposed to the protection of an individual's not non-personal data or even real need in those societies which were becoming dependent upon information systems for their infrastructure and much of the administration.

As concern grew in Europe and North America, committees, working parties and commissions all researched and reported. The issue widened from that of the rights of the individual, to that of human rights generally, then to the sovereignty of nations and most recently to a "new world information order" now being her-

alded in most UN conferences. containing personal data on one country's nationals were held in another country's databases, somehow those files and, by extension, the people referred to would ipso facto be subject to

privacy were a response to a all data? Were countries not likely to be made "data slaves"

Parliament Council of Europe.

OECD, EEC, the United Nations

The problem has been clear

from the beginning — either

data can flow freely from any-

If it is impeded, then com-

munications, good or bad, will

interpersonal contact and

and other bodies all involved.

where to anywhere or not.

competitive forces.

"data robbery".

of those who were rich enough. or clever enough to collect, anaivse and process such data? In addition information was increasingly being transferred by data communications systems, over satellites and with little inspection. This was described in one particularly

dations was adopted by the British Computer Society to IDPM (then DPMA) and by European Computing Sent

There were two essent, principles in the CSA plan! paranoiac session at the Vienna ymposium in October 1977 as The whole debate had now

> 2. That a "beneficial use"; the UK should be mader ponsible at law for compa-This "beneficial user wat: person or organisation whom or on whose behalf for whose benefit data se lected, sorted, processed,

decline with consequent effects on trade, knowledge transfer, Buried in this mass of activity

By Alan Benjamin

originating requirement—that—storage. technology which offers the embraced data on indi means of threat also offers the was suggested. The "be

qualise technological positions.

old world - especially where it is required urgently and is on a large scale, simultaneously affecting many traditional activities; protection is easier and both psychologically and politically popular. As resources are devoted to protectionism. the needs of new growth industries or fledging technologies are

firm, nation to nation.

Oppressive systems of government are made weaker by the availability of information, not by its suppression. The presence of fact, data, choice and option, all represented in information, is anathema to

monster called security. Some regimes believe that security can be a matter of law and regulation whereas — as logicand experience since the begin-ning of history tell us — it can only be a matter of practice and sound organisation. It is to be hoped that the Data

user" would seek pennis those relating to see: appropriate to the sensing

The CSA felt that this big between the needs of them. regulations on data proces was about right.

in other countries would e. tries. Processing could !! place in any country at observed such standards at appropriate "beneficialus" the point to which say to plaint could be directed so responsibility was visible

The flow of data in the countries subscribing to standards could remain the coded—and here is the particular of the dandard of potential of the standard porting liberty for the dividual No licence would be f

to, or process personal country that did not such standards. Of course law could be broken, but are other systems of law deal with breaches of law.

deal with breaches when we might argue which about the order all is sitivity, but at least her approach and can approach and can argue groups of data hay argue credit. Act is a his stellar this idea insorat at the original problem.

PROGRAMMING TEAM LEADER TO £6,000 NJC 6.7 SENIOR PROGRAMMERS to £5,500 NJC G.8 PROGRAMMERS to £5,000 NJC G.B.

As one of the most advanced Honeywell large users in the UK, we're into database and TP in a big way, using Honeywell's latest and best soft-ware — IDS-2 and DMIV/TP — all under GCOS

The installation at our new Computer Centre comprises a dual Honeywell 66/10 with 384K us of care, 2,800 megabytes of exchang disc storage, tapes, printers and a major network of terminals based on incoterm's 20/30 control-

Our first applications are well underway with a major Customer Service System due to go live in April, 1979.

almost certainly know what we're looking for Very

should show you the way we think and the kind of

support you'll get. There's an attractive salary and

commission package.

people world-wide.

simply, it's selling experience and a proven record of

The Software Engineer/Analyst advertisement alongside,

For both positions there's full training and the benefits of

working for a company employing over a quarter-million

 a Programming Team Leader to take responsibility for a programming project team and to assist with system and program specifications;

the best COBOL PROGRAMMERS around to implement a variety of integrated systems using modular/structured programming techniques and on-line program development.

if you have the experience - but not on Honeywell 66 - we'll train you.

We're located in Huntingdon, an area of reasonable housing costs which offers a wide range of leisure pursuits. With Cambridge only half an hour away—and within one hour of London by train, the overall

The Authority offers excellent conditions of service and generous removal expenses if relocation is

If you're interested or went to know more about these opportunities, why not call Jenny Spencer at Huntingdon (0480) 56181 Ext. 371, for information and an application form.

The closing date for applications is 30/11/78, and should be sent to: ANGLIAN WATER AUTHORITY

Brook House, Ouse Walk, Huntingdon, Camba, PE18:6NZ

The REMUNERATION for these positions is in accordance with the alevant scales as applicable in Inter-governmental Organisations, being well above national U.K. average.

Reading, Berkshire RG2 9AX. Telephone: Reading 85411. Telex

data on natural persons is ug In 1978 the CSA submitted Protection Committee and by

I.That any kind of legislas or regulation contemplated the government should appropriate the contemplate of the contemplated the contemp taken on an international dithe use of data and not the L mension, with the European

> These principles have a the test of many debates alternative suggestions for

Among the many sub-issues use the data and wall which have arisen is one of granted such permissionpotential danger — that data codes of practice (inch. low regulations and data protection laws could be used as invisible trade barriers, or insome way manipulated to

It is obvious to all of us that there are many stresses and strains in the world trading position at the moment. clining under the dual attack of technology and better productivity from the third world.

Administration are dean other conducts a network of data protein standards providing signal for the citizens of those conductivity from the third world. Traditional industries are de-

Adaptation comes hard to the

neglected. So it is with data. The protection syndrome is at work - not for the original purpose of improving the social atmosphere for individual, but economic reasons.

We must realise that the flow of data around the world is the very lubricant of freedom as we understand it. Trade, information, knowledge, technology — these all are able to pass freely from person to person, firm to

such regimes.

Another derivative of these issues is the now inflated

ORPM

MATRIXSTORE

The Memory that doesn't spin! ZERO RPM.

MATRIXSTORE connects to your CPU where fixed head drums and disk used to go. Moreover, MATRIXSTORE continues to function long after a drum guits. Without belts, gears, bearings, motors, heads or platters, there is nothing to wear out, burn out, or crash. Nothing spins, nothing.

MATRIXSTORE is the astonishing new memory from Amperif Corporation, the Memory Company, that uses extremely reliable semiconductor storage instead of rotating, magnetic media. Over the long haul, MATRIXSTORE will save you an astounding amount of money,

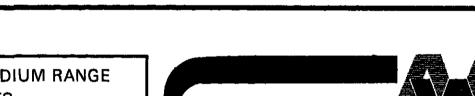
MATRIXSTORE provides vastly improved system throughput, memory availability, and system uptime. Operational characteristics are outstanding providing up to 700 percent savings in floor space, power, cooling, and PM requirements. You will realize a drastically improved return on your investment.

Unplug that first generation drum machine and give MATRIXSTORE a go, MATRIX-STORE comes in storage modules of 262,144 or 2,097,152 words that your current system and programs can't tell from the drum it was designed for. The only difference you will notice is the incredible improvement in throughput because MATRIXSTORE has a data access time that's anywhere from 28 to 118 times faster than the revolving, magnetic machine it replaces. Of equal importance, MATRIXSTORE will transfer data to your CPU up to 4.6 times faster than your interlaced drum.

MATRIXSTORE! Ready now as a plug compatible and software transparent replacement for the FH432 or FH1782 Revolving Magnetic Machine.

Please contact Mr J. Harvey, Managing Director, Link Data Systems Ltd. on 0923-40704 or at 26 The Parade, Watford, Herts WD1 2AA Ask for MATRIXSTORE, the memory that doesn't spin.





These vacancies are open to male or female applicants.

PUBLIC SECTOR

The Word Bank is open for business

rewards are practically limitless.

you're in a technical 'cul de sac' and that your

holding you back from meeting people.

in line with experience.

Telephone Sunbury 85691.

specialisation in computer industry technology is

We'll want you to be involved in client contact. Of

understand the business problems and potential of

experience but, just as important, you need to

customer-clients. You'll be dealing with senior

course, you must have proven technical know-how and

management and discussing benefits and applications

of our 'Word Bank' system. There's an attractive salary,

As a member of the computer industry, you'll already know that in the fast-growing word processing segment the

Siemens, whose word processing system is amongst the European market leaders, has recently introduced the 'Word Bank' into the UK and is looking for new members to join an enthusiastic team.

Software engineer/analyst Word processing sales
If you're the person we want, you may be feeling

Word processing sales
If you're the person we're looking for here, you'll

If you think you've got what we want and we may have what you are looking for, contact Tony Weeks, Personnel Manager, Siemens Limited, Siemens House, Windmill Road, Sunbury-on-Thames, Middlesex.

THE EUROPEAN CENTRE FOR MEDIUM RANGE **WEATHER FORECASTS**

SIEMENS

based at Shinfield Park, Reading, Berkshire

is inviting applications for the following positions:

COMPUTER OPERATORS CONSOLE OPERATORS

The computer system includes a CDC Cyber 175 linked to a CRAY-1 large scale scientific computer. A private network is being established between European Meteorological Offices and our Headquarters.

Computer Operators

The operators are required to control the computer complex. Successful candidates will be required to work in a 4-shift cycle, including weekends and public holidays, under the supervision of a Shift Leader. A minimum of 2 years operating experience on a large scale computer is required. Experience with CDC systems would be an advantage.

Computer Receptionists

Duties involve working with computer peripherals and off-line equipment. Other work involves distribution of computer output and tape duties. These posts involve direct contact with computer users. 18 months' experience is required either as a computer operator or computer

Application forms can be obtained from ECMWF, Shinfield Park,

RATES:

7-£9

13-£8

26-£7

52-£5

£10 per single column centimetre

SERIES DISCOUNTS:

PUBLIC SECTOR

Applications are invited for the following posts within the Polytechnic's Management information Centre based at the Waltham Forest

Head of the Management Information Centre

(Principal Lecturer) (Ref: S/BE.120a) Responsible for the provision of management information development of planning systems for the Polytechnic.

Senior Lecturer

(Management Systems) (Ref: S/BE.120b) To administer, develop and, lecture in, management information

Systems Project Leader (PO1(a)) (Ref: 8/BE.120c)

The above posts will contribute to the Centre's provision of a management information and planning systems service to the Polytechnic as a whole, and candidates should be able to demon-strate appropriate experience in a relevant field. Applicants should be graduates, preferably with post-graduate research or professional experience for the PL and SL post, and with

onal experience for the PO1(a) post Salary Scales:

Principal Lecturer: £7,047-£8,844 per annum* Senior Lecturer: £6,061-£7,572 per annum* £6.012-£6.627 inclusive 'Plus London Allowance

Further details and application form from: The Senior Academic Personnel Officer (2) North East London Polytechnic Forest Road, London, E17 4JB Telephone: 01-527 2272 (Extension 20)

Closing date: November 30, 1978 North East London Polytechnic

THE UNIVERSITY OF LANCASTER

92/1/A OPERATIONS MANAGER

The Manager to undertake complete responsibility for all operatio aspects of a university computing service and to take a leading role in the installation of an ICL 2860 computer with network links to other North-West Universities in 1979. A Degree or equivalent is required at wall as previous operations experience

92/2/A SYSTEMS PROGRAMMER

(O.R. Grade 1A)

(O.R. Grade 1A)

The programmer to join a team responsible for the development of operating systems and installation of systems associated with an ICL 2960 to be delivered in 1979. An important systems responsibility is participation in an inter-university team responsible for the development of the North-West Universities Computer Network. A degree or equivalent a required togother with some previous experience of large operating system.

Balery scale: £3384-£6556

(O.R. Grade 18)

Salary scale: £3384-£5604

HYDRO-ELECTRIC

SYSTEMS **PROGRAMMERS**

£4,660-£7,146

The North of Scotland Hydro-Electric Board will install in their Computer Centre in Aberdeen Dual I.C.L. 2980 computers in mid-1979 to replace their wall established System 4 equip

hensive software including database will be used.
Experienced Systems Programmers are required to develop this software and those with a knowledge of VMEB, MAC, TP or

IDMS would be particularly welcome.

Selaries will be in the ranges £4,660-£6,030 and £5,492£7,146 including Productivity Bonus (Electricity Industry PAG3 and PAG4 scales) and generous assistance with removal costs will be given if required.

If you want job satisfaction in a stimulating environment phone Ken Hutcheon at 0224 692671 for further information or send details of your qualifications and career to:

Computer Services Manager North of Scotland Hydro-Electric Board Computing and Accounting Centre 200 Ashgrove Road West Aberdeen A 89 2NY

MATURAL EMMONMENT RESEARCH MUNCIL — READQUARTERS — SWINDO

HIGHER SCIENTIFIC OFFICER/ SENIOR SCIENTIFIC OFFICER ANALYST/ PROGRAMMER

in Secundar, 1978, the HQ of MERC will legisly a mini composits in light new offices of Swindow to the used for their administrative procedures and intermediate protects.

he seed for our summarrouse presence and laboration system

de Anatyst Programme is required to work with

see considiates on the first single of development
of the se-ling sectorist system and le satisf in the

laphamentalities. Serabe with these hat spected to

extend the system too other areas of extending

and to directly new procedures as they are

eventual.

requi au.

A degrae, RMC ar sejavalent qualification, with all least floor years' experience of developing and implementation politicalization and implementation politicalization in least are years' afford as y

Aglary and conditions The appaleiment will be to the Righer Education Officer or Scaler Schmidt Officer grade. Shalled substy will depend so age and experience bet will be within the following scales:

echeme. Staff of the MERC are not Civil Germain but their pay and conditions of survices are nimber to these

pp and conflictus of service are similar to bloom
of the Cayl Bearing.
Write for supplication terms quoting reference
E2/02/152 for—
Abburat Environment Research Council, Felaring
Boune, North Sir Apenna, Swindon, Wilabler.
Cleaking date for applications: 6 Occambr. 1978.

SYSTEMS

DESIGNER

PROGRAMMER

Ring 01-205 70A1 for a wors detailed job description (Dr L. R. Hill, on Exta 47) and for conditions of employment and application form (Personnel Officer, on Extn. 48)

Central Public Health Laboratory

COMPUTER SERVICES

Salary scale: E6317-£7754

TRUUTHANNIHLES
A science graduate is required for the computer operation of a bacterial identification service. Bacteria from clinical sources are identified by probabilistic enabysis of feat results by reference to computer-stored data bases. Systems use Optical Mark Resder forms. Data Racognition (Destaterm 3) Machines Extel punch tape terminal connocted in the LUCS CDS 6500 time sharing system, current soltware in FORTRAN IV. There is considerable scope for improving the responsiveness of the system and the efficient storage and retrieval of data, and to revise the methodology or explore alternative methodology or explore alternative Salary on probationary scale 12,891-14,275 + London Weighting, Post Probationary scale [3,798-14,899 + London Weighting or Senior Scientific scale, if applicable, 15,451-16,837 + London Weighting.

92/3/A APPLICATIONS PROGRAMMEN

nmer to join a team responsible for the provision of user services support including documentation, package development, software writing, lecturing and advisory duties. Lisison with other North-West Universities is important in this context. A degree or equivalent is required and preferably some experience in a research

Further particulars may be obtained (quoting appropriate reference number) from the Establishment Officer, University House, Lancaster LA1 4YW, to whom applications (8 capies) naming three referees, should be sent not later than 30 November, 1978.

JNIVERSITY OF

SYSTEMS PROGRAMMER

The Centre operates a linked ICL 1906A/1904S configuration under the George 3 operating system, together with two DEC PDP11/40's organise win wo DEC PDF11/40; a providing data preparation and screen editing facilities, and a CTL MOD 5 providing 8ASIC. The Cantre is also actively pericipating in the develop-ment of a new regional network which will fully interconnect the main burn-puting services of the six Midland Universities.

universities. The successful candidate will be req-ulred to work in a group providing user and operations support (planning and advisory services, production of utilities and applications packages, validation and support systems software) and to contabulat to the Center's development projects (including operating systems, ecocunting and budgeting, workflow scheduling and anline networks).

Expérience et scientific programmini language is essential (preferably FOR TRAN, ALGOL 60 or ALGOL 68). initial salary will be in a range o \$5,504 (under review) with USI according to age and experience,

Secondary is against and forms of appli-faulth, returnable not litter than 27th November: 1978, from the Statt Appendments Officer, University or Notlington, University Park, Not dington NG2 280, Ref. No. 538.

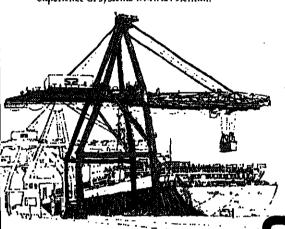
Systems Development and **Operations Staff**

Salaries: to £5,720 annum

The British Transport Docks Board Computer Centre provides computer systems development and operations services to 19 parts and other port industry organisation The Centre has completed a major review of the ports. computing requirements in preparation for the replace-ment of its large mainframe computer. Mini-computers with visual display terminals and communications facilities have recently been installed at major ports to link up with the equipment at the Computer Centre. The Board require the following staff to facilitate the introduction of the new equipment, to work on a number of interesting new projects and to provide continuing

Systems Analysts

Responsible for systems analysis, design, development, implementation and maintenance activities and liaison with programming, operations and user staff. Previous experience of systems work is essential.



Programmers

Cohol and/or Assembler experience essential. For more serior positions, will be responsible for sinte and program design, specification, coding and testing. Will supervise programming staff and liaise with Systems and Operations staff. Knowledge of structural programming

Computer Operations Clerks

The Operations Clerks work on a shift basis (for which additional payments are made) and will be required to operate the Centre's present ICL system I compute, is eventual replacement, and the data transmission and ancillary equipment. They will also undertake data control duties which include liaison with users, assembly disassembly of computer runs and despatch of output. Provious experience of similar work is essential.

Punch Operator

The Punch Operator will be required to operate card, paper tape and Reddon Key-to Disc equipment and also to assist in data control work.

These vacancies offer the opportunity to join a professional and friendly team working to high standards Some travel within the U.K. may occasionally be required the Centre is easily accessible from the MT motorway and Hayes and Harlington Railway Station (Western Region) Conditions of service include 32 days holiday per anium including Bank Holidays, a sick pay scheme, pension scheme and 60p per day luncheon youchers. Applicants are invited to contact Tim Bever, Systems and Programming Manager or Joe Dadin, Computer Operations Manager on Ut 57.15015 or write to British Transport Docks Board, Computer Centre, Hayes Road, Southall, Middlesex UB2 5NE.

British Transport Docks Board

LAMBETH COMPUTER CENTRE

COMPUTER OPERATIONS MANAGER

(£6948-£7665 incl.)

Our Operations Manager has recently left us and we are

We have a twin ICL 1900 installation (128K 1903T and 48K 1902A) with extensive communications facilities terminating on a 7903 front end. In addition a 32K Redifon Seecheck System with 13 key stations is installed in our data preparation area alongside an optical mark

Good practical experience in the management of people is required and also experience in the performance and scheduling of two mainframes with a large batch workload (our programmes use Maximop).

Should you wish to find out more about this job, give Mr. Webb (the Computer Centre Manager) a ring on 01-274 7722 Ext. 437 or Chris Wray (our Personnel Officer) 01-733 7944, Ext. 221.

elication form obtainable from Personnéi Officer, actorate of Management Services, London ough of Lambeth, 18 Brixton Hill, London, SW2. aphone 01-733 7944 Ext. 221. Closing date 30th

.AMBETH

FULL TIME TUTORS REQUIRED

International training organisation, due to expansion within the tutorial department are seeking three additional tutors to teach T.O.P.S. and privately sponsored students in computer operating and programming. Ve envisage a minimum age of twenty-five years and at least two years of computer programming of operations and praterably with a leaching

Telephone: Mike Grosso on 01-388 0691 or write in the stricte confidence to: COMPUCENTRES LIMITED North Wing, Drayton House Gordon Street, London W.C.1

Programmer

LONDON SET

We require, for work on an ICL 1903T Computer a programmer operating under GEORGE 3 on systems for accountancy, stores control. purchase ordering and power station maintenance scheduling. At least one years practical experience of COBOL required and knowledge of FORTRAN would be an advantage Salary within a scale rising from £4194 to £6735 per annum according to qualifications and

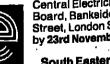
Applications quoting vacancy number 1478/78/CN giving full details should be forwarded to the Personnel Officer (Recruitment).



Central Electricity Generating Board, Bankside House, Summer Street, London SE1 9JU to arrive by 23rd November 1978.

OMPUTER CENTRE COBOL PROGRAMMER

The minimum qualification for this post is 'A' Level Mathematics and a degree or professional qualification would be preferred. Appropriate subjects would be computing science, mathematics, physics, economics, electrical/electrons.



THE POLYTECHNIC OF CENTRAL LONDON

Circa £5800
The person appointed will be responsible for the system injuried properties a dministration and, after's consolidatory properties and injuried properties and after's consolidatory properties and after's consolidatory properties and after's consolidatory properties and administration and after's consolidatory properties and administration and

CHRIS PRIER Assistant Classified

LONDON Eddig Farrel 01-261-8697 Merk Williams 01-261-8698 John Farren 01-261-8098 Nanette Gibbs 01-261-8174 Josep Poole D1-281-8463

MANCHESTER/GLASGOW Owen Kelly 061-872-4211.

BIRMINGHAM/BRISTOL Basil McGowan 021-356-4838

COMPUTER WEEKLY - Highest raquested dirgulation at a cost per thousand 25% lower than the nearest competitor.

IMYRIAD I **APPOINTMENTS** LIMITED

Manager

01-261-8028

Computer Personnel Consultants

is a small price to pay for an exciting career and £5000.

For the cost of a 'phone call you can have the opportunity to apply your 12 months' COBOL experience in an installation serving a major British industrial group. Acting as an internal bureau a wide range of applications are handled - from Film Royalties to Material Requirements Planning. You will have the opportunity to become involved at the design stage of system development, and will be trained in FTL6. You should be prepared for considerable contact with users; attending project progress meetings and visiting user

The current hardware comprises an ICL 1900 mainframe supporting communications links to group users throughout the U.K. and MAXIMOP for on-line program development. A substantial upgrade is envisaged for the near future and a number of other technical innovations are being considered.

Conveniently located, in MIDDLESEX, for public transport, M3 and M4, the company offer excellent conditions of employment (assisted BUPA, non-contributory pension, paid overtime), a starting salary up to £5000 with a review after 6 months, and a first-class career. So telephone now to learn more.

24-hour answering service

Please telephone for a confidential discussion or write to: 30 Fleet Street, London EC4Y 1AA

01-353 0981

IBM Systems Programmer CICS/DOS/DLI/VS upto £6000

A Systems Programmer with at least two years experience in the implement-SUPPORT Of the shove IRM Software is required by a large manufacturing company situated in

The Company process on their present computer a large variety of batch-oriented systems together with a remote Data Communications Link. a remote Data Communications Link. They are shortly to install an IBM 370/138 with one megabyte of memory as the next stage of their progression within on-line computing. The initial development will be to install a COPICS/DLI/CICS on-line production control system

on control system. The Systems Programmer will be responsible for advice on and evaluaion of manufacturers software on-main-frame and mini-computers for current needs. This will include the design and writing of in-house soft-ware, database systems and data

cations software, working closely with semior Systems Develop-The ideal applicant will be of Graduate calibre, aged 25 + and have the ability to generate ideas and imple-ment them without detailed super-

Located close to the city centre, the Company is expanding and is able to offer really good career prospects, job satisfaction and security. Fringe benefits are excellent and include removal expenses where

appropriate:
Applications giving brief personal and career details to Position Number API 324 Austin Knight Limited, 35 Peter Street, Manchester, M2 5GD. client concerned, therefore companie in which you are not interested should be listed in a covering letter to the Position Number Supervisor.

AK ADVERTISING

The Knight contractor. As much at home in Rotterdam as Rochester

Knight Computer Services has contracts in Europe, or even further affeld

Or in your own area of the UK. It all depends on what you're looking for next, and what your experience

proves you can handle. If you work abroad, you'll earn good money, and most of our clients provide free return flights and other

If you stay in the UL we can assure you of a high salary and 🖥 valuable experience that will put another piece in the jigsaw of your career. And, although the length of time that your contract lasts

Kobenhavn is flexible, you'll find that we'll go on working for you for years.

Operators European Languages a distinct advantage

UK CONTRACTS

IBM 370/168/158 OS VS1/2 ICL 2960, 70, 80 VME/K DME ICL System 4/70/2 & 50 J&MULTI System HONEYWELL 66/60

IBM Data 100 IBM System 3 & 32 IBM 370/DOS VS (POWER GRASP & CICS) ICL Writers OS & DOS

ICL 2903/4 Ops.

ICL 1900 GII & GII + Ops. **OTHERS** Burroughs, Small & Medium Systems Honeywell Level 60 Terminal & Small Systems

ICL 1900 GIII Ops. & Data

Controllers

Various Contracts For further details or advice on these or other **UK** and **European** Contracts, call Sue Smyth, June Mogg or Jane Asbury, NOW! on 01-491 4706 or 01-439 3411.

Programmers/Analysts

Immediate/Forthcoming Assignments

IBM COBOL OS - SURREY IBM COBOL-CITY IBM COBOL DOS - SURREY ICT COROF CII - FYZI, FOINDON **BURROUGHS COBOL-SURREY** HONEYWELL COBOL - CITY ICL COBOL GII - LONDON IBM COBOL OS & IMS - BEDFORDSHIRE

IBM OS SYS PROG - ITALY: IBM OS SYS PROG - GERMANY CDC ASSEMBLER - HOLLAND MAINFRAME/MINI FORTRAN - HOLLAND Minimum 2 years FORTRAN+REALTIME

3 years experience of COBOL. Practical exp. ICL 2980/70/60, Knowledge IBM COBOL. Also IDMS FORTRAN APL PL/1 vacancies -LUXEMBOURG

Please contact Richard Kaluzynski of Sue Gillam: 01-4914706 or 01-4393411.

All vacancies are open to both male and female applicants.

RPGII EXPERT-LONDON

Knight Computer Services Limited,

14 Old Park Lane, London W1Y 4NL. Staff Services Division of BOC Datasolve Group and a member of Computing Services Association.

Contract to 12 months - BRUSSELS

4.080

The hottest number in software support

Among computers designed for development of new systems real-time applications, the GEC software such as utilities, macros 4080 is acquiring something of a star reputation. In our opinion. that reputation is wholly justified. We should know-we've just invested over £1 million on six 4080's to form the basis of a new internal bureau. The installation has a total of 50 terminals, and provides all the back-up, needed by a largescale software engineering group, working on highly advanced realtime applications.

To maintain and extend the services we offer our "Customer," we now need a number of men and women-at team leader, and more iunior levels – to maintain, develop and up-date the systems software. with particular emphasis on its . Ltd., Elstree Way, Borehamwood,

You'd also be

and libraries.

advantage.

For the team leader's role, you'll

need at least three years' relevant

experience; for the other roles,

less experience is acceptable.

Experience with GEC Series 4000

computers will obviously be an

If you like the idea of software

support in a real-time scientific

environment, Tim Swann can tell

you all you need to know-and fix

Why don't you phone him on 01-953 2030, extension 3791.

Alternatively, write to: H.E. Batchelder, Marconi Avionics

Please quote ref.MA 78139.

up a time for an interview.

THE LIBRARY ASSOCIATION

BIBLIOGRAPHICAL AND INFORMATION SYSTEMS OFFICER

The Library Association Council has approved the creation of a new post in the Association's Secretariat, working directly to the Deputy Secretary, of Bibliographical and Information Systems Officer. The post will be responsible for the Association's concerns in hibliographical standards and bibliographical systems and sorvices, on-line disvibigments computed software and hardware developments. Viewdats, the creation of a national forum for the discussion of multions related to systems (including Post Office papers and coatings), co-ordination of the doors view of nationally provided services, and also to ensure professional invidevolopments in these nices, a g. Unescoland Council of Europe programmes.

it is expected that the surcessful applicant, who should be a Chartered Ubraran, will have a wide knowledge of general information and bibliographical information systems and services, nationally and internationally, and will have some recent uspeciance of work in on-line systems.

The post offers an exeming exportunity for someone with energy and integination to work at the centre of this activity

The salary agreed by LA. Council is on the Assistant Secretaries scale — £6.985 to £7.497 p.e.

Persons interested should apply in writing to the Deputy Secretary's Department, The Library Association, 7 Ridgmount Sweet, London WC12 7AE, for a detailed job description. The closing date for the receipt of applications will be 12 December, 1978.

AMERICAN EXPRESS INTERNATIONAL BANKING GROUP

SYSTEMS DEVELOPMENT GROUP

MINI-COMPUTER **PROGRAMMERS**

The U.K. Banking Group's Computer Systems Development Programme now requires mini-computer programmers to work on sophisticated real-time TP Systems. The Group is based at our Moorgate Offices using High Level Languages on Honeywell Level 6/43 ni-Computars.

Provious experience on this machine is not necessary as training will be provided.

We seek candidates who are of Senior programmer potential who would like to join a small but expending team.

Salary level: Circa £6,000. Plus all the frings banefits normally associated with a melor

Please apply in writing stating age and experience to:

A. J. Reynolds
Deputy Personnel Manager, UK Region
American Express I.B.C. c/o.120 Moorgate, London EC2P 2JY



the world's leading expert on

ANALYSTS AND PROGRAMMERS WITH RPG II EXPERIENCE

'When the problem's solved and the system's set up and running, wouldn't you like to be moving on?'

Not much chance of that in most user-companies though, is there? You just have to sit there playing. nursemaid and wondering what onearth you're going to do for excitement next.

But think what it would be like with a really successful, professional software company.

Altergo Business Systems spring immediately to mind. They have hundreds of clients in different industries needing a wide variety of applications — always new problems and new surroundings.

Computing Services Association



Quite apart from the constantly renewed challenge they pay very well too. Just show them you are capable, ambitious and experience on IBM systems such as System 32/34 or System 3.

What can you lose by talking to Altergo? You'll certainly find they can build your career around your circumstances. If you want to travel, fair enough. If not, don't worry.

Contact Brian Walker or Barry Whitesman quoting BS/16, d 01-734 9681 or after 8.00 p.m. on 049-481 2713.

Altergo Business Systems Limited, Warwick House, 38 Soho Square, London W1V 5DP

Senior Financial Systems Analyst

The Financial Systems and Development Section at British Gas Headquarters, which is responsible for development and implementation of new accounting systems and new approaches to the problems of financial planning and control, quire a Senior Financial Systems Analysi

Applicants must have a record of successful achievement in the field of financial jems. The competitive salary reflects the emphasis placed upon proven technical ability in the design and implementation of financial computer systems at a working level. An ability to work with the minimum of supervision and a high degree of selfmotivation are required for this position.

Formal accounting qualifications, while an advantage, are not as important as the requisite experience.

The annual salary range for this position is £8613-£9963 (inclusive of £456 Inner London Weighting). The commencing salary will be within this range. Please write with full details of age, qualifications and experience quoting reference F/030501 to the Personnel Manager, British Gas, 59 Bryanston Street, London W1A 2AZ. Closing date for applications 28th November 1978.

BRITISH GAS

COBOL PROGRAMMERS SCOTLAND, YORKSHIRE AND NORTH WEST.

Supero opportunity to join small dynamic team. Excellent sejarles and conditions, interesting, shallenging, varied work. Full-time of pariting / Freelance.

Telephone: Knutsrote 53417 or 961,236 9761

TO ADVERTISE YOUR RECRUITMENT SE

Project Leader

A well established international engineering organisation has an opportunity for a Project Leader to join the systems development group. Candidates should have at least four years experience in the design of commercial applications, particularly accounting or manufacturing, and have been responsible for one complete project from feasibility to implementation. Ability to motivate staff and liaise with users is essential.

Excellent salary and large company benefits. Relocation assistance available. Contact: Jim Baker

c £7,500

Marketing Analysts

London/Manchester

c £7,000 + car Our client, a leading mini-computer systems manufacturer, is introducting a brand new product to the UK market place. The product, developed in the USA, will enhance the excellent range already offered by this company. Marketing centres are being set-up in London and Manchester. Analysts, preferably with ICL mini experience and a flair for marketing, are required urgently. Technical and business awareness are the main criteria.

Excellent career prospects and employment package. Contact: Mike Creamer

Software Programmers

£4,500 -£7,500 A small but highly successful mini-computer manufacturer based in mid-

Hertfordshire, has vacancies for several programmers to join their ever growing software development team. This company doubled its turnover last year and is set to do the same again this year – to over the £4 million mark. Prospects for advancement to managerial and other senior positions could

Software development experience is not essential for the more junior posts – an interest in a manufacturing environment and a good knowledge of ASSEMBLER level programming is all that is required. Language and compiler development experience would be useful from applicants for senior

Superb opportunities for ambitious and dedicated technicians. Contact: Andy Wright

Systems Analyst

A major international drinks firm is installing a new System 34 next February, and require a Systems Analyst to join their small but vital d.p. department, us soon as possible.

The successful candidate will have full control of all systems, and will obviously be expected to play a major role in the installation. One of the first requirements from the new equipment will be a Management Information System. The Analyst will be completely responsible for this system including designing and implementation.

A programming background would be useful, RPG II being the main language, but good systems and business experience is essential.

Contact: Andy Wright

Technical Advisers – Minis/Micros

West/North of London

to £6,500 + car & bonus

Excellent opportunities have arisen with a small business systems manufacturer, for experienced software/commercial support persons to provide liaison and technical aid to a wide ranging customer base. Candidates should have a minimum of one year's implementation or post sales support experience, of small commercial systems. Since the key function is client iaison. appointees will be personable individuals with the ability to communicate effectively with technical managers. A substantial starting salary will be paid to attract high calibre people.

Contact: Margaret Stevens

FORTRAN Programmers

£3,500 to £6,500 Our client, the research group of a well-known organisation, has immediate vacancies for a number of technical programmers, both at junior and senior

Ideally, applicants should be graduates in engineering, mathematics or other scientific disciplines with six months experience of FORTRAN for the junior positions and up to four years for the more senior posts.

Salaries are negotiable, with excellent fringe benefits, including relocation costs, in a truly professional environment.

Contact: Jim Bal Contact: Jim Baker

For further information on any of the above vacancies please contact the appropriate consultant. If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES. International Personnel Consultants 16 Maddox Street, London W.1. Tel: 01-491 4478

JUNIOR PROGRAMMER

S.E. LONDON

CW46/1 Michael

If you have only just started as an RPGII programmer, this company will be interested in you. They only require six months experience on System 3. They offer help with relocation expenses and other company perks. You will help them in developing a new order entry and sales ledger system (we also have three companies in the city looking for more experienced RPGII programmers).

OPERATORS

Do you like bureaux work? Good, then this ICL GII and GIII installation will allraot you. 3 shill system and 21 days, hole, spic.

CW46/2 Patricla

OPERATORS

Il you have 18 months IRM OS expetience, the contributed from Early will be interested in you. They have a 2/0/140 fluis 10 2/00 and teresting 12 hour shift added allows generous lines of the plants perks too.

OPERATORS/SENIOR OPERATORS

To £4:200 lng. NA MILION KETNES

OPERATOR

£4.700 Inc.

IUNIOR SYSTEMS ANALYST

N.W. LONDON

A major construction company with a small but powerful ICL installa-tion requires a systems snallyst with a programming background to work on a variety of commercial and segmenting applications. Nos CW46/7 Michael

JUNIOR PROGRAMMERS

£3,000 to £4,500

You have only I year's commercial experience? Then you are in great demand. We have a large selection of first-rate companies who need paople like you. Some offer mortgage assistance to the right can-

CW46/8 Tricle

S.E. ENGLAND

PROJECT LEADER

didales after short period with them:

uk s overskas

Recruitment Consultants

UNIVERSAL COMPUTER ASSOCIATES LIMITED Data Express House, 3-Prospect Place, Heathfield Terrace, Chiswick W.4.

01-9953883 (01958 6188 EVENINGS)

MINI COMPUTER PROGRAMMERS

LONDON & HOME COUNTIES £4.000 to £8,250

If you have experience in ASSEMBLER or micro-code or com-munications for at least 11/2 years then a whole exciting field is open to you. We now have opportunities in S.W., N.W. or W. London, Surrey, Berks, and Herilordships for competent people in this rewarding field. The future is definitely going to be with the MINI-computer professional. Telephons for details.

CW46/10 Michael

DEC PROGRAMMERS

LONDON & HOME COUNTIES

We now have commercial user organisations and 24 Soltware/Con-sultancy firms locking for DEC Programmers with 18 months or more experience. Why not may us now and enquire about your change to improve both salaries and slatus. BSTS or RT21 experience are added.

CW46/11 Michael

SENIOR BYSTEMS ANALYST

The Triple has not be greated in the firmed business and the store dentifies each speak from the fractions of the firmed business of the firmed light freshlation and sequire people with commissively superiones to work in new and

CW46/12 Michael

SENIOR CONSULTANTS

Three Crucial Dates for Computer Professionals

Hear about the exceptional opportunities we're offering to

Project Leaders Senior Analysts **Analysts**

For our exciting new development using mainframe and minicomputers in a distributed processing environment, including on-line and data base, we're looking for staff of the most able and imaginative calibre to guide and support this challenging project, which includes production, marketing and accounting developments.

To make sure we get them - and quickly - we're making three opportunities available to tell you about it informally, in a hospitable atmosphere, on whichever of the occasions indicated below is most convenient for you.

So choose one of the hotels on the appropriate day and come along and hear about the very competitive salaries and the whole attractive future that goes with them. If you can't make it, please telephone 01-422 3434, ext. 281 and ask for Iain Lee.

CHOOSE FROM:

Eurocrest Hotel Shoppenhangers Lane, Maiden head Sunday 19th November, 11a.m.-5p.m.

The Master Brewer Motel, Hillingdon

Monday 20th November, 12 noon-8.30 p.m.

The Great Northern Hotel, Nr. King's Cross/St. Paneras

Thursday 23rd November. 12 noon-8.30 p.m.

Philips Data Systems

a division of Philips Electronic Industries

offers international opportunities for

Software Development and Support Specialists

Experienced up to £12,000p.a.

Graduates from £6,000p,a,

Philips Data Systems wish to recruit for their Headquarters in Holland, and for their other locations in Holland, France and Germany, experienced Software Engineers and Graduates in computer science, mathematics and engineering.

Systems Software Designers and Developers

The work involves specification, development and design of new software products in the following areas:

- ransaction orientated operating systems Real time operating systems
- Data management and data base management systems

opportunities for transfers worldwide throughout the Philips Organisation.

- **Data Communications**
- Distributed systems, network development. Programming languages, compiler construction

Application Software Experts

Experts can be assigned to one of the following activities:

- Investigation, specification and implementation of application software development methods
- Application research
- Application orientated systems software evaluation
- Coordination of application package development
- Network assignment coordination in customer projects

Software Support **Experts**

Support people are assigned to the following

- Release preparation Support of sales organisations through
- the world Problem solving
- Advising of development departments and ,Quality control usability
- Pre-sales support ...

Evaluation of new products

Salaries, of up to £12,000 are negotiable for experienced candidates, depending on ability, expertise and location, and new Graduates in compile science, mathematics or engineering, can expect starting salaries of £6,000+. All salaries are reviewed annually. First class benefits include Pension Plan, Health Insurance, and generous assistance with housing and relocation expenses. There are excellent

Applications including a full C.V. and quoting reference IO/c.w. should be sent to John Higgins, Personnel Manager, Philips Data Systems, Elektra House, 2 Bergholt Road, Colchester, Essex CO4 6BE, and applicants should note that initial interviews will be held in the UK, and final interviews in Holland, if required further details concerning these appointments can be obtained from Mr P.C. Hölscher at Apeldoom in Holland on O10.31 65 230 123.



PROGRAMMING CONSULTANT

c £8,000 + Expenses + Benefits

LONDON — NEW YORK — MIDDLE EAST

My client, an international consultancy, has recently secured a contract to build a teleprocessing application for a customer in the Middle East. The system will be based on state of the art mini hardware, and when developed will be installed in New York and Riyadh.

You will already have some exposure to Series I hardware and teleprocessing systems, and be flexible enough to spend several days at a time abroad. Working as one of a three-man team, you will be able to build on your expertise and look forward to a career of truly international flavour.

Call GEOFF MARSH on 01-499 4501 NOW

RW/46/1

AN OPPORTUNITY FOR LOW LEVEL PROGRAMMERS TO BECOME

to £8,000 + Relocation

Young, well-educated Programmers are wanted to develop, augment and modify systems software for one of the world's leading manufacturers. Whether you are already involved in software engineering or are looking for the opportunity to make the transition we want to hear from you. A sample of the projects you could be working on are:

- * Performance evaluation and subsequent tuning of existing systems software.
- * Time critical code in data communications software.
- **★** Operating system development.

Individuals will be expected to demonstrate their ability in identifying problems and in proposing and executing their solution. Successful candidates can look forward to a satisfying career with a manufacturer committed to staying at the forefront of technology.

MY CLIENTS REQUIRE PEOPLE IMMEDIATELY SO CONTACT ME GEOFF MARSH ON 01-499 4501 NOW

hutchingon-scoggins recruitment 47/48 New Bond Street (entrance in Maddlox Street) De London W1Y OHE Telephone 01-499 4501

Can You Handle A Small/Medium D.P. Installation? Bournemouth

deally you will either be an experienced Analyst/Project Leader ready for your first managerial appointment or already in management looking for the opportunity to widen your experience. Currently we are undertaking a major

e-design of our D.P. system to process our Life Assurance business using a new Hewlett-Packard 3000 and an on-line data base approach to system

one major project from design to implementation

You will report directly to Senior Management and be responsible for the complete production aspect of the Department including computer operations,

system design, programming and computer scheduling. You will also be responsible for a staff of ten analysts, programmers and operators. We offer an excellent remuneration package and in

- a highly competitive salary
 generous staff mortgage scheme and full
- relocation expenses — a non-contributory pension scheme
- including free life and sickness assurance 25 days' holiday per annum - excellent career prospects with a real
- chance of promotion in the future. If you are seeking a challenging and rewarding



Richard Garrard Personnel Manager Gresham Lite Assurance Society Limited PO Box 1 2-6 Prince of Wales Road Bournemouth BH4 9HD Tel: 0202 787855 Ext. 208

The Certified Diploma in Accounting and Finance

hequalification in accounting and finance for all non-accountants.

Telephone 01-636 2967 for full

MID GLAMORGAN COUNTY COUNCIL

SYSTEMS ANALYST

County Treasurer's Department

(Commercial Project Team)

SYSTEMS ANALYST

(Borough Council Project Team)

Salaries £4245-£5568

experience and are negotiable. The authority currently operates an ICL 19045 computer and is now actively planning for the introduction of an ICL 2972 computer next

A minimum of one year a systems experience is desirable an applicants must hold a suitable qualifica

A flexible working hours scheme is currently operating The County Council's scheme for the payment of lodging and disturbance allowances and removal expenses will apply.

NATIONAL CONDITIONS OF SERVICE Application forms (to be returned by 1 Dec. 78) are obtainable from the County Treasurer, Mid Glamorgan County Council, County Hall, Cardill.

CANVASSING WILL DISQUALIFY.

HIGHLAND HEALTH BOARD TREASURER'S DEPARTMENT

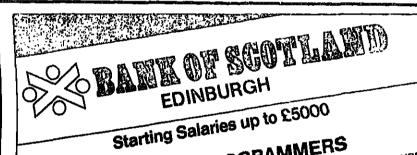
ANALYST/PROGRAMMER Salary Scale: £4,421-£5,326

Applications are invited for the above post in the Computer Services Unit which is situated in the grounds of Hilton Adda da

The current workload encompasses a variety of financial and madical applications which is processed on an ICL 2904 computer.

Applicants should have at least two years relayant experience and be conversent with ICL Cobol and Software.

Application forms and further particulars may be obtained from and should be returned to the Personnel Officer. Highland Health Board Resy House. 17 Old Edinburgh Road, Inverness. IV2 SHG, not later than 24th November, 1978.



ANALYST PROGRAMMERS We are looking for competent Programmers with a minimum of one year's experience in either COBOL or Assembler. Experience in design and experience in either COBOL or Assembler. Experience in either COBOL or Assembler.

experience in either COBOL or Assembler. Experience in design and specification would be advantageous, as would familiarity with DL1. The ability to work within a team is essential.

Our Project Development Department is actively involved in a number Our Project Development Department is actively involved in a null of demanding applications, both batch and on-line, including the development of a new Branch Terminal Network.

SYSTEMS PROGRAMMERS

We are keen to augment our existing Systems Programming expertise we are keen to augment our existing systems Programming expert by recrulting a technically skilful Programmer, Experience with IBM hardware under VS1 or MVS is essential, while familiarity with Assembled Would be an advantage.

As part of its technical support function, the Systems Programming Department's work includes.

- system generation and maintenance evaluation and installation of software packages
- development of general purpose software support for on-line system development using IMS and SNA

The Computer Services Division of the Bank offers altractive
The Computer Services Division of the Bank offers altractive
Conditions, including flexible working hours facilities,
Expression, preferential nouse purchase facilities,
Expression, preferential nouse purchase facilities.

Please write or telephone for an application form to:

Mrs M. C. Pinkerton, Assistant Staff Controller,
Bank of Scotland, Poblertson Avenue, Edinburgh EH11 PZ
Benk of Scotland, Poblertson Avenue, Edinburgh EH11 PZ
Benk of Scotland, Poblertson Avenue, Edinburgh EH11 PZ
Benk of Scotland, Page (Ext. 188)
Telephone: 031-337.2488 (Ext. 188)

Telecommunications in ICI

Data Communications Engineer Holland

An experienced Data Communications Engineer is required to be based in Holland. He/she will plan and co-ordinate the implementation of data communication networks for ICI throughout Europe.

The person appointed will assist consultants to specify the data network requirements in detail and be responsible for engineering these projects into operational services. This includes responsibility for scheduling and co-ordinating the installation and commissioning of the various equipments associated with the data networks throughout Europe.

The technical education required is at least City & Guilds Technicians Certificate in Telecommunications with several years practical experience of planning, commissioning or maintaining data networks.

A knowledge of other European languages is desirable. Salary level 50-54,000 DFI. Please write or telephone for an application form to:



Senior Personnel Officer, ICI Head Office Services Dept, P.O. Box 3, Fulshaw Hall, Wilmslow, Cheshire SK9 1QB. Tel: Alderley Edge 582828 Ext 5238.

Senior **ComputerOperator** with large systems experience

Southampton

£3824+20% shift allowance

Associated Container Transportation Services Ltd. operates world-wide through container services on behalf of five major shipping lines. Recently we have installed a B6700 computer with an on-line Database system to supplement and eventually replace our existing Honeywell

We now require a Senior Operator to work with both of these installations.

If the challenge of such a position appeals to you, and you have obtained a couple of years large systems experience, preferably with Burroughs equipment, we should like to hear

The post is based in our modern air-conditioned offices in Southampton and relocation expenses will be paid where appropriate

The Company offers in addition to the salary, an attractive range of fringe benefits.



Please write or telephone for an application form to: Mrs. L. Lisney, Assistant Personnel Officer, ACT Services Ltd., Richmond House, ferminus Terrace, Southampton. Tel: (0703) 34433

Junior Commercial Programmer West Country

An opportunity has arisen within the Plessey Marine Research Unit, Templecombe

We are looking for a suitably experienced man or woman to join a small software team involved in a variety of accounting and engineering support projects. With at least 1 year's experience, you should be self motivated and keen to develop new skills. Knowledge of FILETABIFTL6 and GEORGE III would be useful, but familiarity with any high level language would be acceptable. A competitive salary will be negotiated in line with experience and qualifications. Generous assistance will be given with relocation expenses, temporary lodging and

Please telephone or write, giving brief career details, to Stuart Carter, Personnel Manager, Pleasey Marine Research Unit, Wilkinthroop House, Templecombe, Somerset. Tel: Templecombe (09637) 551.



T.I. Bainbridge Silencers Ltd.

Data Processing Manager c. £8,500, plus car

T.I. Bainbridge Siloncers Limited is the largest manufacturer and distributor of coment exhausts in the UK, employing over 800 people, with a sales turnover in excess of £20m. It consists of two manufac turing plants, two major warehouses and a UK -wide network of seventeen subsidiary

Located at Atherton in Lancashire the company currently run a varioty of computer System 32 or sundar installation in real time systems for stock control, invoicing and sales ledger. The systems operate on a variety of computing resources, including n-house minis, bureau services and time sharing on other maintrames.

In order to rationalise and enhance their computercapacity the company are developing a new distributed data processing system avenue for further advancement. to link their factories, depots and warehouses, which will eventually entirely replace the existing systems.

In order to continue this development and build up the new computer department the company wish to appoint a Data Processing Manager. Reporting directly to the Director/ General Manager, the Data Processing

Manager will be totally responsible for the umplementation of the new systems includency the recountment and training of computer staff

Applicants, aged 30 - 35, should be gradual or have an equivalent professional qualification. They must have had at least eight years data processing expensace with two years in the consequenced of a medium sized IBM operations. They should have sound know-Indge of strick control, production control and financial systems and experienceins distributivo trado would be an advantage. This is an exciting opportunity to develope now system which will be in the forefronte existing technology and there is a clear

Salary will be negotiable around £8,500per annum, a company car will be provided. there is a contributory pension scheme and the usual range of large company benefits For an application form men and women and invited to write or telephone in confidence to Genffrey Lawcock at the address below fiele phone 01-229 6742) quoting reference 593.

Urwick Dynamics Limited S Monmouth Road London WZ 4UT Computer and Selection Consultants

Computer System Manager

To manage a mini-computer installation confusional 21 MAI computer with initially 256K Bytes of memory, multiple Discs. multiple VDU's, Line Printer, Paper Tape Recorder and Punch, and a

Rosponsibilities will include instructing users in the developing of Fortran and Assembler programs, implementation of system program up-date; and planning and execution of system expansion

Applicants, men or women, must have experience in generating RTE operating systems. A degree in computer, science would be a

Suitably qualified and experienced condidates are invited to tolophone or write to: G. A. Botts, Decca Radar Ltd., Davis Road, Chossington, Surrey, KT91TB.

DECCA * In space to Control of the C

Programmer

Offshore Oil Industry

Hayes, Middlesex

Vetco Offshore Limited, a well established international company application engineering services and equipment to the offshore exploration and prolingues in the company of industry, is installing an IBM System 34 linked to a US mainframe and an additional programme. an additional programmer.

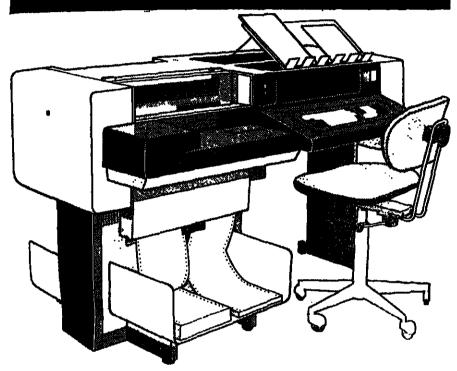
Reporting to the Supervisor, Systems Group, successful candidates must be at least three years experience of COBOL programming, preferably manufacturing environment, and be able to work with the minimum supervision.

In addition to an excellent starting salary, benefits include four weeks him plus eight statutory days per annum and occupational pension and assurance place. assurance plans.

Please telephone of write to Iris Faulkner, Vetco Offshore Limited, Ventura House, 72-74 Station Road, Hayes, Middx, Tel: 01-579 7733.



good reasons why you should join



I MONEY

YOU COULD EARN UP TO 28,500

We pay a generous basic salary and substantial bonus (no upper limit) based on ability and effort. In addition, we also pay car/travel allowances to our software people.

2 SYSTEMS

WORK ON A VARIETY OF APPLICATIONS We are not an in-house computer operation. We provide software

upport to 700 + clients across the U.K. In providing support for these clients, you will work on a wide sariety of commercial applications and increase your business systems knowledge and experience extremely

3 MACHINE RANGES

NCREASE YOUR TECHNICAL EXPERIENCE We support four ranges of computer. As a Manufacturer, we mently release new equipment to keep pace with technology and the demands of the market place. You will be trained to support more than one range of machine.

4 FIELDWORK MEET OUR USERS

c. £6,000

You will work closely with high abevel client representatives during project development and implementation at their Offices and ours. These are not desk bound jobs.



5 OPPORTUNITY

We are a computer company. It is therefore logical to conclude that our best computer people move upwards into management and other high level positions much more quickly than in any other environment. We promote from within.

6 FRINGE BENEFITS

Flexible working hours, BUPA, Pension and disability scheme. Subsidised canteen. Four weeks holiday. Modern clean offices. Good working conditions. Social club. Free car park.

-COME AND TALK-If you have at least 6 months Office

Computer, Mini-Computer or Mainframe experience we would like to meet you to discuss what we' can offer you and what you can offer us.



PERMANENT **ESSEX**

c. £7k **Systems Programmer**

Our Client is a major user of IBM kit operating under OS and is currently looking for a complete Systems Programmer to work on current TP developments and future projects. Numerous large company benefits including a car allowance are offered. Ring now for a quick assessment of your chances.

Programmers

If you have at least two years' Assembler experience and like working in green belt country, then do not hesitate to take advantage of this challenging position. Get in on the ground floor of the fast expanding mini/micro market now!

Programmers

to £5k

If you have only 18 months' experience in COBOL and/or PLAN and want to embark on a very interesting career path with a large organisation that is stable but dynamic, and in addition if you wish to cut commuting costs while at the same time benefiting from good in-house training, then phone immediately for details.

Analyst Programmers

If you have IBM-COBOL or BAL or PL1 and would like to work for a large company with a very interesting hardware configuration, and are keen to become involved with advanced development projects, then our Client would be very interested in hearing from you now. Several worthwhile benefits are offered with this attractive

Systems Programmer

If you are not interested in commuting to London but interested in working in

cheerful surroundings in South Essex, this could be an ideal opportunity for you. If you are really good at DOS POWER-VS and wish to move to higher management later, then phone us now.

LONDON Systems Analyst

If you have good systems experience with an IBM background and also have a knowledge of PL1 or Assembler and some Database expertise, this could be an ideal opportunity for enhancing your career prospects. Our Client is mainly involved in the Import/Export business and is located in the City. Get in touch immediately for further details.

Programmer

Our Client, a large retail chain situated in W.1, is seeking a competent person to develop and enhance their current system which is run by an ICL 2903 using COBOL. Should you be interested in taking advantage of this excellent opportunity, please get in touch immediately.

Technical Analyst Programmer c.£6k

Our Client, an engineering company in W.C.1, is looking for a person with an IBM 370 background to help develop new systems and enhance already existing ones. If you have good FORTRAN experience backed by some BAL, then phone now and improve your future prospects.

Analyst Programmer

Our Client, a large multi-national Petro-Chemical concern, is seeking a highly motivated person with good IBM 370 COBOL experience backed by some CICS expertise. Should you feel qualified for this very interesting position which has excellent future prospects then now is the time to take advar Telephone now, press your luck! Ref 9CW1118 Neg

Programmer

A challenging opportunity exists for a Burroughs COBOL Support Programmer to work within a Bureau environment. The work is varied and in return an attractive

For these and many more rewarding positions get in touch now with John McLean

BRENTWOOD (0277) 212021



Or write to him at LINSCOTT COMPUTER SYSTEMS LIMITED, P.O. 74, BRENT-WOOD, ESSEX CM 15 OBZ



IX. BUILDING PRACTICAL AND THE FIRST 多则即原在列門 11/1///11日間 企业的原理的激励以前,10月9月2月12日 用,使为的图像2000间隔,在外面自由力的2012年在2012年中的基本的基本的

CONTRACT DIVISION

BENELUX

IBM OS ASSEMBLER IBM SERIES I ASSEMBLER BM 3790 EXP PROG PDP FORTRAN KN OF FRENCH PDP MACROII RSXIIM SEN ANALYSTS KN OF EITHER FR/GER/DUTCH ANALYSTS KN OF EITHER

HOLLAND HOLLAND BRUSSELS HOLLAND FRANCE £ EX RATE

FRANCE £ EX RATE

IBM ANALYST PROGRAMMER COBOL/PL/I OR ASSEMBLER KN OF FRENCH/GERMAN IBM PROGRAMMER : ASSEMBLER/ COBOL/OR PL/I KN OF FRENCH/GERMAN OR DUTCH IBM JUNIOR PROGRAMMER

FRANCE £ EX ATE

FRANCE £ EX RATE

ASSEMBLER/COBOL OR PL/I KN OF FRENCH/GERMAN

FRANCE £ EX RATE

C. LONDON £220 p.w. C. LONDON £250 p.w.

£250 p.w.

£220 p.w.

£220 p.w.

CONTRACT DIVISION LONDON & HOME COUNTIES

SINGER SYST 10 ASSEMBLER SYSTEMS PROG DOS/VS CICS + COBOL IMS PL/I DB DC OS/VS PROGS

IMS OS COBOL PROG/ANALYST IMS OS COBOL/ASSEM PROGS IBM OS TSO COBOLAN/PROGS IBM DOS/VS COBOL/ASSEM IBM AN/PROG OS COBOL IBM SYS 3 360/370 RPGII ICL 1900 PLAN/COBOL

IRELAND £220+p.w. CITY £250 p.w. £240 p.w. £220 p.w. £240 p.w. £200 p.w. HERTS £220 p.w. £200 p.w. C. LONDON VARIOUS N. LONDON £190 p.w.

ICL 2903/1900 COBOL PROJ LDR ICL 2960 VMEB/K AN/PROGS TEAM LDR PDP BASIC COMPILER PDP MACROII + CORAL PDP CORAL/ALGOL/ASSEM COMPILER EXP **BURR 6700 COBOL** IBM 370 RPGII + COBOL PDP BASIC + RSTS/E

HERTS SURREY BUCKS 1900 + IBM EXP. AN/PROG. TSO

£200 p.w. £220 p.w. N. LONDON £220 p.w. HERTS £200 p.w. C. LONDON £190 p.w.

AS A SUCCESSFUL INTERNATIONAL RECRUITMENT AND CONTRACT ORGANISATION WE HAVE CONSIDERABLE EXPERIENCE IN ASSISTING COMPANIES IN INDUSTRY AND COMMERCE THROUGHOUT THE UK AND EUROPE CALL YOUR NEAREST K.P.S.L. OFFICE AND DISCUSS THE MANY OPPORTUNITIES AVAILABLE TO YOU



Ring Christine Kay/Dave Hayton 734 0152/6 (24 hours), 27 Noel Street, W.1

Offices: AMSTERDAM, PARIS, MANCHESTER, BIRMINGHAM

Computer Personnel NEW YORK

£8,000-£13,000 per annum.

Our Client, Computer Technicians Incorporated -Systems Division, a U.S. based consulting firm has opportunities for Programmers and Systems Personnel to join a major U.S. bank, located in the Wall Street area of New York City.

Programmers—minimum of 3 years

Programme Analysts—minimum of 3 years

Systems Analysts/Programmers. Senior Systems Analysis.

These permanent positions offer the opportunity to gain substantial experience in a ophisticated environment. Candidates who must have a knowledge of I.B.M. and/or N.C.R. systems should apply in writing, with a full curriculum vitae to:

C/o PARC, P.O. Box 834, Wrights Lane, Kensington, London W8 ESR. Tel: 01, 937 824)

1900 and System 4 COBOL Programmers

Develop your career into Training

Our Training Division in Windsor needs Programmers with 2-3 years' experience of 1900 or System 4 COBOL to help meet the needs of our growing business in 1979 Read on If you would like a change

from applications coding and a move into teaching what you know to our customers and staff. The job offers: training in communication and

presentation techniques. continuous development of your own technical expertise.

career paths to 2900 range.

starting salaries between £4,500 and £6,500 depending on experience.

courses around the UK and oversea

pleasant rural working environment with a host of recreational facilities. relocation assistance where

Teaching others and meeting new people, whilst increasing your own knowledg and experience, can be immensely rewarding. For more information and an application form, phone Mike Perkin on /indsor 68181 ext 253 or write to him quoting reference CW1088, to ICL, Beaumont, Old Windsor, Berks SL4 2jP.

International **Computers** think computers - think ICL

SALOP COUNTY COUNCIL

PROJECT LEADER (TECHNICAL SUPPORT)

£5,727-£6,702

Applications are invited from experie Programmers to lead the Technical consisting of software and data specialists training appropriate to the needs of the be given, experience of at least three of the areas would be desirable VM and CMS. POWER/VS and RJE, DL/1, PL/1, CGS-POWER/VS and RJE, DL/1, PL/1, Applied to the control of the control o monitors and an enquiry package Applic satisfying this requirement, but who will experience in the manual of the satisfying the requirement. experience in these areas will be considered

The Council, at present, operates a 37 growing terminal network and substar nents are scheduled. Developh ments are scheduled. Developing under interactive information system is being under this post will play a major part by providing appropriate and cost effective software.

BLACK & DECKER

Maidenhead

Systems Analysts to £7,500

Berkshire Programmers to£6,500

Major new developments in data processing create the need to recruit a small number of top class systems development staff. These appointments will be based at the company's UK headquarters in Maidenhead, Berkshire.

The opportunities are truly outstanding and will involve major systems development in the key areas of manufacturing, distribution, service and finance. In technical terms advanced hardware and software (including database) will be utilised, and the systems will be inter-active and extend the links to all the United Kingdom locations.

Additionally, there will be projects involving the European operations of the company.

THE COMPANY

Black and Decker is a highly successful world-wide company with an impressive growth record. In recent years the sales and profits growth of the company has been outstanding increasing three-fold in the last five years even through times of major economic difficulties.

In the UK the company has 3 manufacturing units, 2 in the South, at Maidenhead and Heathrow, and a third at Spennymoor in Co. Durham, together with 26 high street service centres.

THE VACANCIES

The opportunities are outstanding but not unnaturally the requirements are very demanding.

SYSTEMS ANALYSTS

A good educational background, preferably with university or professional qualification. In dp terms you should have a number of year's systems experience and in depth knowledge in the manufacturing, distribution or financial areas.

PROGRAMMERS

In addition to first class educational qualifications good practical programming experience is required. This will involve a number of years using COBOL in a commercial environment. Experience of real time applications an advantage.

THE PROSPECTS

Progression within the company is based on merit and with a policy of internal promotion and with the company's growth record there are always opportunities for good people.

Development plans will provide the successful candidates with a very clear promotion path within data processing. However, our client would also like to think that the people recruited by this campaign will be able to make their mark not only in dp but in general line management in due course.

TO APPLY

Please write in the first instance to Ivor Norton at either of the addresses below giving full career details. Initial interviews will be held at convenient centres throughout the UK.

Ivor Norton Management Services Ltd





PILKINGTON (S) ST. HELENS





NEED

SENIOR SYSTEMS ANALYSTS **ANALYST/ PROGRAMMERS** SENIOR PROGRAMMERS TECHNICAL SUPPORT PROGRAMMER

OFFER

- 1. IBM 370/158 facility (in-Company). 2. On-line and database applications
- (increasingly), 3. Distributed processing (remotely).
- 4. Excellent fringe benefits (invitingly).
- 5. A competitive salary (naturally!).

We are recruiting for Pilkington Brothers a major International Group of manufacturing companies with their headquarters based in St Holens, Morsoysido. The Data Processing Centre is a group function providing services to their UK and overseas companies

They are currently utilising an IBM 370/158 under OS/VS with on-line and database systems using CICS and DL1. You will be involved in their expansion of Database and On-line applications combined with a move towards distributed processing.

Major application plans currently under way cover all areas of business systems including computerised systems for an advanced technology manufacturing plant. You will receive excellent formal and practical training combined with real career opportunities.

Ideally candidates should have a minimum of 2 years' experience which should include ASSEMBLER for the Technical Support Programmer.

CONTACT: David Wade on 061-833 0427 or 0785 58013 after 7.00 p.m. or at

ADDRESS: Freepost, Blackfriars House, The Parsonage, Manchester.



Net Ry

The Oversus Recruitment Consultant
The Oversus Recruitment Consultant
HOWARD ORGANISATION INTERNATIONAL LIMITED
Employment Business Section
8 Eistee Way, Boreliam Wood, Heritordshire
Tyl. 01-823 4088

BURROUGHS L.9000 OPERATOR

Required for leading West London Auctioneers and Estate, Agents based in W.12. Salary negoti-

Please contact Willmotts, 01-773 444. Ref. TMHM for further details.

SALES SUPPORT PROGRAMMER

GEC Computers Limited specialises in the design and marketing of advanced computer systems for real-time scientific, industrial and commercial applications. The Technical Marketing Department provides Technical Support to the Sales Engineers, analyses the customers' requirements and prepares proposals on how to meet these requirements utilizing the

The Department runs a large GEC 4000 Computer System and a major part of the jeb involves the development of demonstrations, running of bench-mark tests and making presentations to prospects.

We are seeking a person (male or femals) who has some femiliarity with Operating Systems and who wishes to use this knowledge to demonstrate the range of software produced by us. Experience in programming is essential, and candidates should have a knowledge of more than one programming language.

We offer an interesting and demanding career. The salaries and fringe benefits are those normally associated with a large

Those interested should apply by telephone or in writing to: Mrs. E. Harrington, Personnel Department, GEC Computers, Limited, Elstree Way, Borehamwood, Herts, Telephone: 01-953-2030 Ext. 3697,

GEC COMPUTERS LIMITED

DEK TECH OFFICER London WO odd communication, self motivated and with project time experience in varied DP beckground for in

PROG/ANALYST

PROGRAMMER

xpenance of 2 years of PL/1 for this 370/148 in

COMPUTECH 01-794 0202

Two years expenence with RPG2 for client in machine tool industry, IBM S3 mod, 15d installation.

SEC

Northern Vacancies Your Passport to Success for 1979

Manchester M3 8BB

ADDRESS TELEPHONE Home

Extra Systems to date

Operating Systems

• SUCCESS

INTEREST

· MONEY

If you are considering a new position in 1979

then we can help you. Typically. **PROGRAMMERS** to £6,000

ANALYSTS to £7,000 ANALYST/PROGRAMMER to £6,000 SCIENTIFIC PROGRAMMERS to £7,000 SALES PEOPLE

£12.000 + CAR

Whatever your language experience we can help you. Cut and the coupon today (no stamp required) to IRENE ROGERS LORIEN COMPUTER SERVICES, FREEPOST, LEEPS LO Alternatively ring IRENE on Leeds 444185.

LORIEN COMPUTER SERVICES

OCS House, Servia Road, Leeds LS7 1NJ Telephone 0532 444185

EXPERIENCE?

then consider

OPERATIONS SUPPORT

in Croydon

£4,500 to £5,500

Are you currently a senior operator or shift leader with three years operating experience gained in an IBM 370 DOS environment?

Then if so, here is the ideal off-shift position for you.

A large international company successfully installed earlier this year an IBM 370 mainframe in a purpose. built data centre in Croydon. Running under DOS/VS and POWER/VS both batch and on-line work is

Our clients wish to recruit a further member for their operations support team. The work will be varied and interesting, involving procedures, scheduling, controlling various aspects of the operations area, and close liaison with the Systems and Programming

In addition to a good start salary, benefits include a non-contributory pension and free life assurance. The company is well known to us here at Capp

Associates and we have no hesitation in recommending the friendly working environment to Interested applicants.

For further details contact our CROYDON office quoting ref; CW 48-8S.

CAPP ASSOCIATES 5 Computing Services Association



Dreaming of pastures new?

Systems Analysts and Programmers:

Your dreams could become reality at Ansty. Which is where Rolls-Royce Industrial & Marine Division is, in a truly rural situation.

Our business is adapting famous aeroengines to non aero applications. We are part of a revolution offering high efficiency, compact power plants to industrial operations and world navies.

Commercial success in such high technology relies on effective and comprehensive management systems. Our Systems Department has to react quickly to constantly changing demands. Which is why we need reinforcements and why - in our dynamic team - you'd have the challenge of close involvement in new projects and the satisfaction of devising your own solution to a variety of

problems. Programmingisin COBOL. Equipment is

via VDU's which also provide on-line enquiries to daily updated files. The installation is operated 7 days per week around the clock. We want people at all levels. If your

ICL 1900 with hardware replacement

strategy currently under review. User input is

experience is limited, we'll train you — if you can prove your basic ability. Your salary will be competitive, related to your performance and constantly under review. Overtime is paid.

There are plenty of pleasant places to iive nearby — in warwicksnire and southwest Leicestershire. Generous relocation expenses where appropriate.

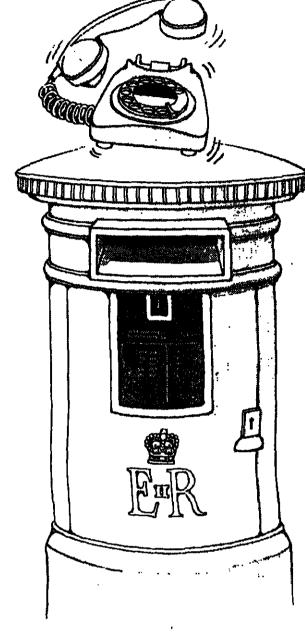
Don't just dream about fresh woods and pastures new. Spring into action!

Phone (reverse charges) or write for an application form to Mrs K Brown, Personnel Administration Manager,

Rolls-Royce Limited, Industrial & Marine Division.

POBox 72, Ansty Coventry, CV7 9JR. Tel: Coventry ... (STD 0203) 613211, ext 60.

Means toanend



You want a better job.

We want you for some of the best computer jobs around.

So how do we get together? The choice is yours. Phone Andy Mogg now on

or send the coupon,

Knight Computer Services Limited,

14 Old Park Lane, London V Telephone: 01-491 4706. Please send me an application form.

Phone No....

Your kind of job. Your kind of people.

MYRIAD APPOINTMENTS LIMITED

Computer Personnel Consultants

ANALYSTS

SUSSEX

Neg. c £7000

To complete the heavy schedule of development already underway our client must now augment their team by the addition of two experienced Systems Analysts. The position will offer opportunities for project leadership and control and the design of

computerised systems using the most advanced techniques and hardware Applicants for the positions should have a sound D.P. background with around two years

systems analysis involvement. The company offer a competitive salary negotiable depending on experience, together with the benefits associated with a large organisation.

SYSTEMS ANALYST and PROGRAMMERS

SOUTH HERTS

TO £6600 Our clien, one of the country's leading retailers is currently developing an extensive range of

- If you would like:
- ★ To receive training in advanced ICL software
 ★ Develop COBOL programs in an on-line environment
 ★ Involvement with Point of Sale terminals and word processors
- ★ Staff discounts on company products * Generous holiday entitlement

-and you have a minimum 18 months' COBOL programming and/or analysis experience. then this could be the opportunity to establish yourself in a secure and progressive installation

PROGRAMMERS IN SURREY

Why commute for first-class opportunities and

PROGRAMMERS possessing 2 years' + experience of COBOL or IBM Assembler, with an interest in career development should consider the first class opportunities available with our client based in N.E. Surrey who offers

- * Latest IBM Equipment including Laser Printer
- Comprehensive Training Database & Telaprocessing * Excellent Career Prospects
- Sports and Social Club (Free Staff Restaurant)
- * Superb Benefits Package worth c £1000

The data processing departments development plans will continue well into the sighties and programmers joining the company now can expect a varied and interesting future. Starting salary is commensurate with experience and additional benefits include flexitime, paid overtime, modern working conditions and an excellent relocation package

NEW SYSTEMS

WEST MIDDLESEX

£4500-£7000

Analysts and Programmers

With the expansion of our clients development section, ideal opportunities now exist for Analysts and Analyst / Programmers.

The successful applicants will enjoy working in a stimulating and highly profession environment and contribute extensively in the implementation of the company's future D.P. projects offering Analysis complete involvement and Programmers exposure to advanced software techniques and inter-active programming.

A sound knowledge of general commercial applications gained in a medium size installation plus two years' programming and/or systems experience covering program design and

The company is a large organisation offering a secure future and caron progression in addition to all the usual large company benefits.

Ref. NW1/1611

24-hour answering service Please telephone for a confidential discussion or write to:

30 Fleet Street London EC4Y IAA

_ 01-353 0981

SHIFT **LEADER**

required by the London Data Centre, Hammersmith

Remuneration package of £5,000-£5,700 including shift allowance and production bonus. In addition there are ample opportunities for overtime.

Due to continued expansion a Shift Leader is now required for our Univac 90/60 running both batch processing and on-line systems, operating over three shifts, five days a week.

The successful candidate, who should have OS4 experience, will lead a small shift team with ample opportunity to demonstrate initiative and leadership qualities

In addition to the remuneration package we offer generous. discounts on Company merchandise, together with pension and sickness benefits and excellent holidays.

The London Data Centre is an associate Company of Top Shop and Top Man (members of the Burton Group), two of the most successful retail chains in the U.K.

This is an excellent opportunity to join a small professional Company in a congenial working atmosphere and you would be advised to call Geoff Griffin without delay to discuss the

LONDON DATA CENTRE

275/281 King Street, Hammersmith W.6. Tel: 01-748 8986

the second of the second of the second of the second

CONTRACTS

At least 2 years' OPERATIONS experience?

If you are a freelance operator now, or intend to go freelance in the near future contact us for details of our current and future assignments in all areas of the U.K. The ability to communicate and an intelligent attitude towards freelance works considered essential.

IMMEDIATE

ICL SYSTEM 4 J 1800 OPERATORS ICL G2+ OPERATORS (ALSO PART-TIME) **ICL 2903 TECHNICAL SUPPORT ICL 2903 OPERATORS ICL 2900 VMEB OPERATORS** IBM OS VS1 OPERATORS OS JCL WRITERS NCR CENTURY OPERATORS DDE/PUNCH/VDU OPERATORS

FORTHCOMING

IBM OS VS1 OPERATORS ICL SYSTEM 4 J 1800 OPERATORS **ICL 2904 OPERATORS** ICLG2+ OPERATORS **ICL G3 OPERATORS** ICL VMEB/K OPERATORS ICL VMEB SHIFT LEADER DATA CONTROL CLERKS HONEYWELL GCOS OPS (ALSO PART-TIME) 24 hour etc.

* MANY WELL-PAID PERMANENT JOBS * PHONE OUR PERM TEAM FOR DETAILS * We pay excellent rates (and expenses) to our Contractors

PHONE 01-439 6481 (24 hour answering service) for more information



Morgan Guaranty Trust Company of New York

OPERATIONS ANALYST - 370 DOS/VS LONDON up to £6,000

PLUS

- * Low interest mortgage facility
- * Non-contributory pension plan
- * Free medical and life insurance plans
- * Profit sharing
- * Subsidised meals
- * Subsidised travel

If you are already working in an operations support role, then this job is for you.

You will be responsible for the efficiency and productivity of the machine area, but an equally large part of the job involves trouble shooting of related problems. Ideally we would like you to have a thorough understanding of DOS/VS concepts and facilities; knowledge of POWER/VS or CICS/VS would be an advantage.

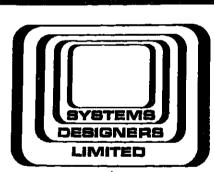
There are nine new systems to be implemented over the next six months, PLUS major upgrades to the existing duplex mainframe configuration.

Opportunities for job satisfaction and career progression are excellent, while a comprehensive training plan may also be of interest.

PHONE NEIL ARMSTRONG on 01-603 7335



58 Pembroke Road, Landon W8. Telephone: 01-603 7335/6. Telex. 261298 Computer Services & Recruitment Consultants



Programmers and Senior Programmers for Manchester and Surrey

Systems Designers Limited is an independent British systems consultancy, backed by the NEB, and with an unrivalled reputation in minid micro computer applications. Established in 1988 and currently 150 strong, the company expanding its operations in both the UK and abroad. A full order book and continued demands for our high uality service have produced an immediate requiremen engineers for our Manchester and Camberley (Surrey) offices

Current projects are challenging and rewarding and the company policy Current projects are challenging and rewarding and the company policy of full participation of all members offers broad prospects and opportunities for rapid progress for top people.

Requirements exist for people with broad experience in the design and implementation of mini and micro computer systems using both assembler and high level languages. We are interested in hearing from programmers and senior programmers with at least two years' experience. Applicants must have good academic qualifications and a proven software ability together with a professional outlook.

Please write to or telephone SYSTEMS DESIGNERS LIMITED at

MANCHESTER ^{(el:} Manchester (061) 928 9306

CAMBERLEY Tel. Cemberley (0276) 62244

M. J. HALE ASSOCIATES LTD. FREELANCERS - NAME YOUR PRICE WE PAY OUTRAGEOUS SALARIES

Systems Design + Coral or similar

Honeywell Cobol ICL/IBM Cobol

MANY OTHER VACANCIES SO GIVE US A RING AND YOU'LL GET THE BEST DEAL AROUND. CALL ALAN HOWARTH ON 0279 25068

FOR THE BEST JOBS IN THE SCIENTIFIC AND TECHNICAL COMPUTING FIELD -CONTACT US NOW

As specialist agents in the Engineering. Scientific and Technical industry we now deal with over 4,000 companies throughout the U.K. There is an urgent demand from these companies for experienced and Graduato programmers with FORTRAN experience. Jobs from £3,500 to £8,000 to

FORTRAN CONTRACT

Capital Appointments, 28 Windmill Street, London W1 Tel: 01-637 5861 (day) — 01-638 8659 (eves.)

OPERATIONS MANAGEMENT C £7000

Essex - very urgen

N. Londor



If you're currently working in a fairly senior capacity in Operations (e.g. in a supervisory or managerial position), these vacancies which have arisen through Whitbread's continuing expansion and development could present an outstanding opportunity for you:-

MANAGER FOR LONDON CENTRE

Reporting to the DataCentre Manager, will take direct responsibility for operations staff and generally ensure the smooth and efficient running of the department.

MANAGER FOR NEW DATACENTRE

To be based initially at our London Centre. He/she will be the key figure in setting up our brand-new Centre at Luton (recruitment. machines, on-site problems, co-ordination, etc.), and after this initial period will assume full responsibility for Computer Operations staff at the new Centre.

Both these vacancies represent exceptional opportunities. We are looking for sound professional d.p. experience and ability in man management, with the accent on initiative and

In return we'll offer responsibility, genuine promotion prospects within the Whitbread Group. substantial company benefits and more

Ring Penni at SBS on 01-734 0563. She'll tell you more about Whitbread, the jobs themselves, and discuss your prospects with us.

SO SCIENTIFIC & BUSINESS SYSTEMS LTD 29-31 OXFORD STREET; LONDON WIR THE

With anything can happen... to Cobol Programmers

Before

lused to feel like this chap looks. I worked hard, long hours, and I lacked reward, motivation, a professional environment and the opportunity to enjoy life.

There we were, the other lads and lasses and me, with 11 yrs.-3 yrs. COBOL experience on lots of different machines, reasonable competence and hoping to improve ourselves. No chancel



After

We saw this ad. for Commercial-Union. I talked to Capp, they told me about the lob and all these benefits -

- ★ Salary £4,250-£5,250 ★ 370 COBOL OS/VS1, ROSCOE
- * Free lunches ★ 331 hour, flexitime week
- ★ Preferential mortgage (5%) * Excellent relocation package * Low cost pension and
- life assurance ★ Good training

So I went for an interview. joined them and as you can see what I'm looking forward to ...



So ring CAPP ASSOCIATES today quoting ref: CW 45-8J and start as soon as possible. Enjoy the benefits of CU living!



CAPP ASSOCIATES Computing Services Association



HEAD OFFICE: 01-686 9693 (24 HOUR ANSAPHONE) 19 PARK STREET, CROYDON CR9 170 NORTHERN OFFICE: 061 236 9085 (24 HOUR ANSAPHONE) FAULKNER HOUSE, FAULKNER STREET, MANCHESTER M1 4YD

Software Specialists

NEED RECOGNITION AND REWARD!

OUR SOFTWARE SPECIALISTS GET BOTH BECAUSE THEY

OWN

WE NEED YOU because the major manufacturers of Europe need us to develop commercial applications for their small business systems.

Their problems include development of hardware. operating systems, languages, APPLICATION PACKAGES, marketing of existing products and new products pased upon microprocessor tech-

Holland Automation provides THEM with the com-



You are a programmer able to discuss and design solutions for clients and then implement them cause your experience includes assembler and includes level languages together with a sound understand ing of the commercial applications of small in ness systems.

Your present company provides you with a salary, a car and a package of benefits - but do really distribute all of the profit entite employees?

Holland Automation does both to provide X the complete solution.

Ring and ask for lan McEwan who will with information, assess your experience immediately arrange an interview.

Morgan Guaranty
Trust Company of New York

SHIFT LEADER c. £5,500

LONDON IBM 370 DOS/VS

c.£4,700

OPERATOR

- * Low interest mortgage facility
- ★ Non-contributory pension plan
 ★ Free medical and life insurance plans
- Profit sharingSubsidised mealsSubsidised travel

SHIFT LEADER

- * 4 years' 370 DOS/VS experience
- * JCL knowledge ★ Experience of CICS and/or POWER/VS.

- **OPERATOR**
- * 2 years 370 DOS/VS experience
- Basic knowledge of JCL preferred
 Basic knowledge of CICS and/or POWER/VS

In addition to the above, the following may also be relevant:

- * exciting hardware upgrades to existing twin mainframe configuration within the next six months.
- * Monday to Friday shift system, affording two extended weekends out of three
- * good career opportunities within pre-determined training paths

PHONE NEIL ARMSTRONG on 01-603 7335



Information Processing Facille

58 Pembroke Road, London W8. Telephone 01-603 7335 / 6. Telex. 261298

ANALYSTS/ **PROGRAMMERS**

South Coast

Up to £5,800

Our client, an international leader in digital communications systems, is looking for Analysts/Programmers with at least three years' experience in computer systems. They will be required to develop software, to diagnose faults "on line" within the hardware and digital computer systems which contain a large number of specialised peripherals. If you have a hardware/ software background, our client would be particularly interested in hearing from you. Our client's offices are based on a beautiful part of the South Coast where moderately priced housing is available. The Company offers a superb re-location package, and a career structure tailored to suit your specific expertise. In the first instance, please ring John Nolan or Barbara Compton on 01-584-8476 or write quoting ref TE.24

Thurloe Executive

Special Projects Division 4/18 Harrington Gardens, London SW7

Telephone 01-584 8476



IMPERIAL COLLEGE OF

COMPUTER **PROGRAMMER**

successful candidate will be associated with a theoretical research group working in leser physics and his principal task will be to design and operate Fortran programs on the College's CDC 8400 / 8500 camputer facility. Applicants should preferably hold an honeus

SYSTEMS ANALYST **UP TO £7 1/2 K**

8. L. T. Parker, Administration Manager
BARCLAYS UNICORN GROUP
983 ROMEORO ROAD, LONDON E7 SJE



to score with this coupon!

For the better jobs in the North & Midlands, clip the coupon (or phone) NOW!

N	lam	e			<u></u>	: 1: : :		:	1	1.1	`) P		1	
	ıddı				 14				Ţ,	3; (1)	400			
7	75.		<u> </u>	9.12		(i. i.		7	Но	me	Tell	la :		, i

Qurfent position. Salary.

Sampson Staff 16 Poradilly, Mandlester MT 11.7

459 Bath Road Slough SL1 6AA Tel: 06286-65232

Holland Automation International (UK) Ltd.

ARE YOU LOOKING FOR SALES MANAGEMENT?

One of the Major Computer Manufacturers is looking for 2 experienced medium / large systems sales people, who have reached Senior Sales Executive or Junior Sales Management status, but are now ready for the next step.

You will be given responsibility for very large existing and new accounts, where you can expect to sell £2 MILLION to £20 MILLION systems.

The rewards are high. A guaranteed income of approx. £11,000 in the first year, plus bonus, which will give earnings of £14,000 to £15,000 per annum, but could be much more.

They want people who are mature, clear thinkers, sound business negotiators able to operate at all levels.

Excellent career structure, real management opportunities, etc., etc., exciting possibilities abroad.

If this interests you, please 'phone or write to the Senior Consultant quoting CW 177.



INSIGHT MARKETING & PERSONNEL CONSULTANTS LTD. 72-75 MARYLEBONE HIGH STREET LONDON W1M 4AJ Tel: 486 5644



SALES EXECUTIVES— -NORTHERN ENGLAND CAN YOU REALISTICALLY EARN £15,000?

If you can sell, and have been successful selling small/medium business systems, this is a REAL OPPORTUNITY to join a Major Computer Systems Manufacturer — who offer:

REALISTIC TARGETS not ficticious ones.

REAL EARNINGS not promises.

Achieve targets and you will earn £12,000 BUT most are earning £15,000

REAL PROMOTIONAL OPPORTUNITIES

The best career development structure in the industry.

PROFESSIONAL SUPPORT to help you achieve SUCCESS

This company, one of the most successful, is looking for Sales Executives who want to join in that success, make real money and advance their career.

Please 'phone or write to the Senior Consultant, quoting ref. no. CW 178.



INSIGHT MARKETING & PERSONNEL CONSULTANTS LIMITED 72-75 MARYLEBONE HIGH STREET LONDON W1M 4AJ Tel: 486 5644

BRANCH SALES MANAGER £14K-£16K plus car

SOUTH LONDON AND HOME COUNTIES

Exciting opportunity to join a very successful, fast growing International Mini Computer Manufacturer, well established in the U.K.

If you know small/medium systems, and can show a good track record, this could be for you.

Excellent base salary, non-returnable guarantee, management bonus, plus company car, giving £14,000 p.a. Branch Manager average earnings this year, c. £16,000.

You will be Sales Manager for South London and all Home Counties South of the Thames.

Please contact the Senior Consultant.

SENIOR SALES EXECUTIVES — MINIS

UP TO £17,000 + CAR THROUGHOUT U.K.

How would you like £10,000 guaranteed with commission on top, plus company car?

- ★ Most Salesmen are earning £17,000.
- ★ Rapid growth to management from within
- ★ Last year over 40% growth, this year again over 40%
- * Good reference sells, good support, good products

Get out of the rut and get **rewards** for your efforts.

Please contact the Senior Consultant.

Ref. No. CW 183



INSIGHT MARKETING & PERSONNEL CONSULTANTS LTD. 72-75 MARYLEBONE HIGH STREET LONDON W1M 4AJ TEL: 486 5644



SALES MANAGEMENT—NATIONAL ACCOUNTS

c. £15,000 p.a. +++

Have you sold £1/2 million systems (or larger)?

Can you sell at very senior levels? Can you manage large sales campaigns?

Can you manage and grow existing large installations?

Would you like a Sales Management position, and the prospects of an excellent career with a Major International Computer Manufacturer?

The money is excellent. You will earn approx. £15,000 p.a. with prospects for much more. First year guarantees are made up of base salary and non-returnable guarantees equaling £10K-£12K. Commission/bonus paid in addition.

This is a superb opportunity to join a professional company at management level, who look after their people.

Please telephone the Senior Consultant quoting Ref. No. CW 180



INSIGHT MARKETING & PERSONNEL CONSULTANTS LTD. 72-75 MARYLEBONE HIGH STREET LONDON W1M 4AJ TEL: 486 5644





TODAY

FOR A BETTER

TOMORROW

SEE PAGE 47

Digital System Design **Aviation Division**

of Smiths Industries

require

2 Engineers

Having two or more years experience with

*Airborne Computer Software

*Real Time Computer Operation

*Failure Survival Techniques

For work on the design of

New Flight Control Systems.

Reply quoting Ref.FCR to Mr. H. Upson,

MYRIAD

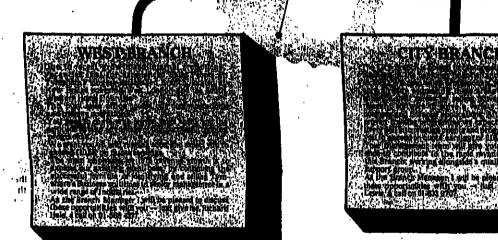
SALES EXECUTIVES

Tymshare UK is a leading US Bureau specialising in the solution of complex business problems. The Company market a range of powerful software products aimed to giving senior management direct access to accurate up-to-the-minute and company making the vital decision process a quicker and surer one.

Targitare entered the market-place in 1966 and have grown to a Company over 2,500 personnel, running application entered the market-place in 1966 and have grown to a Company over 2,500 personnel, running application to the company have sales and service offices throughout. American the United Kingdom, weight, Europe and Japan. They have developed sophisticated application software and a computer services of the communication system. The company is the planess.

It is not the communication of the company over the company over 2,500 personnel of the company over 2,500 personnel of the company over 2,500 personnel, running the planess.

It is not the company over 2,500 personnel of the company over 2,500 personnel over 2,500



NORTH BRANCH

Applicants should have a minimum of 2 years' sales experience, gained ideally with oither a hardware manufacturer, bureau organisation or with suppliers of office computers. Due to the unique nature of the systems involved, extensive training in the Company's product is envisaged, together with the opportunity to move into the marketing of applications systems. Successful candidates will receive an excellent basic salary, with potential to achieve carnings well in excess of £10,000 per year, car assistance and excellent conditions of employment.

To discuss the company and vacancies in greater detail contact Tymshare's consultants:

Myriad Appointments Limited 30 Fleet Street, London EC4Y 1AA 01-353 0981



Freelance **Programmers**

We have IBM 370 Mainfromes and will pay attractive rates or programmers with a minimum of four years' programming experience, at least a year of which is on IBM 380/370 equipment using COBOL under DOS or DOS/

If you have the relevant experience and would be interested. in a long-term contract in the Northern Home Counties area then contact us.

Write to BOX No. CW12

Box No. replies "MARKED PRIVATE AND CON-FIDENTIAL" to: D. C. Madden, Personnel Manager, Group Personnel Services, John Laing and Son Limited, Page Street, Mill Hill, London NW7.2ER. WORCS - GLOS - WILTS -DORSET

AVON - SOMERSET - DEVON To £8k +

A wide range of vacancies exists from Programmer to Systems Designer in the above counties (25 + alone in Glos.). The equipment in use is also varied. It includes ICL 1900, and 2800 series, IBM 370, DG NOVA. PDP.11, Honsywell and Vairian. The languages vary from COBOL to ASSEMBLER to PLAN to PL-1 to Besid In short there just isn't enough room to tell you shout them all. Should you already live or wish to relocate to this exhaulting part of the world, then urgently of one.

Bristol (0272) 42863.1 Hertfordshire County Council

MID-HERTS/BOREHAM WOOD COLLEGE Department of Computing, Science & Technology

LECTURER I for Programming

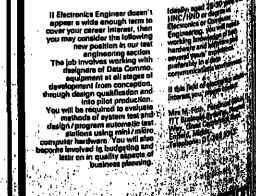
(COBOL and BASIC) and Business Data Processing Sound commercial ex

periance needed, preferably with teacher training or experience.

Parkilme applicants elso wel-comed:

Fuither information and application form from the Principal Blattse Way, Botallam Wood Hets.

ITT Business Systems



If your big chance is coming up, don't expect to see it advertised. If all the good career opportunities were advertised,

newspapers would be as thick as telephone directories.

So how do you get your name and ambitions in front of the people who can offer you the chances you never see? There's no great secret, no inside knowledge just post the coupon below.

Over 3,000 attractive employers - big companies and small - tell us about their staffing opportunities. When you post the coupon below, we send you a concise application form to be completed and returned.

Give us all the relevant details about yourself, your career, your ambitions and those companies you would not like to work for . . . these facts will be treated as highly confidential. They will also be compared to our clients' personnel requirements and every time they match - you'll be

shortlisted for a key job, one which has probably never been advertised. And our clients will contact you direct. So from the comfort of your own armchair you can prepare your own case for a better deal, and then wait to hear

directly from a company which thinks you're worth it. Quick, efficient, and free. Thousands of people have already used Lansdowne. Some of them have

Lansdowne Appointments Register, Design House, The Mall, London W5 5LS. Tel: 01-579 2282

filled the jobs that you didn't see

(24 hour answering service).

BOROUGH OF TORBAY

Analyst/Programmer

Salary grade SO 1/2 (salary range £5232

The authority currently has an IBM 370/115 running under OOS/VS with CICS and emphasis is now being

bloom DUS/VS with CICS and emphasis is now being placed on the development of local and remote being processing. The successful candidate will have five years minimum experience in developing computer applications, preferably in the local government environment. Applicants with practical experience in any of the following will have some arrivantage: PL/1.

any of the following will have some advantage: PL / 1, RPGII, Assembler, TP (preferably CICS).

emoval expenses, etc., in appropriate circumstances.

Candidates must disclose any relationship to a member or officer of the Torbay Council. Canvassing

Applications should include name, address, age, qualifications, present and present each present each present each present each present and secure of two referees, and be sent to the Borough Treasurer, Town Hall, Torquey, by 27th November, 1978.

Assistance may be given with housing accom

Treasurer's Department

to £6060 p.a.)

Senior Systems

Data

Processing

Manager

South East

The Mail, London W5 5LS. Tel: 01-579 228

A major engineering company in South East England, manufacturing equipment for the automotive industry, have a vacancy for a Data Processing Manager to head a department providing a comprehensive data processing

ception in proteing a competer size can be designed in the position involves responsibility for the day to day operation of the computer and punch rooms, computer systems and programming and the design and implementation of new systems. In an expanding company.

The successful candidate is likely to have a high tenderal of company and directions.

nie successiu carinicate is iliety to nave a night standard of general education, a sound knowledge of manufacturing systems and experience of RPG if and system analysis with IBM System 3. Equally important is the ability to communicate at all levels and to itaise with

user departments.
Salary is negotiable up to £7,500, dependent on qualifications and experience, plus other benefits associated with a forward looking company.
Please write, in strictest confidence, with sufficient

rease white, in sucress contineence, what substitute in career details to eliminate the need for an application form to Steve Guesford, MCS/ROBERTSON & SCOTT (ADVERTISING) LIMITED, Acom House, 314-320 Gray's Inn Road, London WC1X 8BN, quoting reference number G124 and listing in a covering letter any companies to whom your application should not be sent.

Our clients are keen to meet men and women, aged 20 to 40 years, with potential earnings of between £4000 and £8000 p.a.

& Scott Recruitment Advertising • Search • Selection.

SMITHS INDUSTRIES LIMITED Bishops Cleeve, CHELTENHAM

Internal Auditor (Computer) Robertson Offices in London, Marichester, Glasgow, Edinburgh, Aberdeen, Darlington, Henford, Offices & affiliation worldwide.

Salary £6300-£6750 (based at Reading) The use of computing at Thames Water is expending Currently we operate twin IBM 370/148's which support a large teleprocessing network, and an ICL 1904S providing a service which includes on-line programming. There are also various agency and commercial bureaux arrangements.

We require an Internal Auditor to join the Computer we require an internal Auditor to join the Computer audit activities. In particular, you will be involved in the review of new and existing computer systems, the examination of the computer operation and the socurity of the Authority's computer installations. You will be based at Reading and will be expected to visit the various offices within the Authority.

Candidates (male or female) should have significant experience of financial computer systems and the ability to criticise constructively and communicate

Benefits include a casual car allowance (subject to review), generous holidays, staff canteen, good social and sporting activities.

Applications, giving the names of two referees, to the Director of Finence, Thames Water Authority, Nugent House, Vastern Road, Reading, Berks RG1 8DB by 1st December, 1878.

Thames Water

Computer Department Post 1

ON THE SOUTH DEVON COAST

Essential: RPG II, IBM 32 or System 3 experience and good French. Desirable: IBM Assembler or Series.

Successful applicant will subsequently be trained in Senes 1 and PL/1 and must be prepared to

Post 2

Essential: PL / 1
Desirable: Series: 1 or IBM 360 / 370, Assembler,
Systems programming experience,
Good French, Probably some travel Conditions for both posts: Salary £5000 + . Good leave. Subsidised restaurent.

Please contact: Mr. H, Speigelhalter, Regional Personnel Manager, 46 Wimpole Street, London W1M 7DG. Telephone 01-486 7528

AMERICAN MEDICAL (EUROPE) LIMITED

Programmers and Analysts

Enots manufacture a wide range of pneumatic control equipment. compression and push-in tube fittings in a factory located in pleasant rural Staffordshire.

The Company are developing a wide range of applications in the areas of Sales Order Processing, Production Control, and Finance using on-line and telecommunications techniques.

Applications are invited from suitably qualified people, who have experience in these areas.

Personnel Manager, Enots Limited, P.O. Box 22, Eastern Avenue, Lighfield, Staffs, Tel, Lighfield 64161.



COMPUTER ENGINEERING PACKAGES SALES

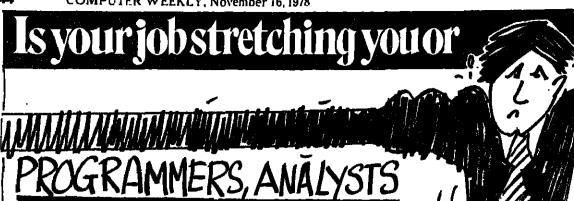
C. LONDON ... ENEGOTIABLE

A investe opportunity has wissen with one of our metor clients to; a parson with embilion and sales flair to cale on the challenge of selling existing engineering software products and seveloping row products:

You must be evere of market possibilities and the enathods of essessing potential makets, be ship to sage a sales dupts and work towards at advancy on proceedings without and relevant sales Herstope This job hydres regular review of products being sold; and recommendation of excitions to the range.

Applicants must be Engineering Greaturing With appearing a ponution of engineering (composite package sides, salytoments, seeking a ponution of greater responsibility, in addition to a competitive palary; you will enjoy the panellis associated with a large scale propriator.

AMES



- # ASK YOURSELF, ARE YOU REALLY STRETCHED-
- # ARE YOU BEING EXTENDED TO YOUR FULL POTENTIAL.
- * DO YOU HAVE A CLEAR POSITIVE PROGRESSION IN YOUR CAREER.
- * Are you in control, or are you left to be
- CONTROLLED. k have you stopped learning in your Job.
- REEN STRETCHED TOO!
- NOW STRETCH YOUR IMAGINATION AND THINK ABOUT
- ... IF IT'S NOT STRETCHING YOU TOO FAR.

Initially London based then overseus opportunities - Saluries are by negotiation and webs. a reputation of being top payers-Reviews are at least twice in year one-Weoffercontain

All ARBAT jobs are TASK crientalod-and career progression is on merit and from with Want to hear more about the other benefits-We will send you a profile on ARBAT-andaras, nterviews locally-Phone or write NOW to discuss the opportunities with-

160 Queen Victoria St. London, EC4V404 Office No 01-248 6499

> Inner London **Education Authorh**

South East London Color Lewisham Way, London SE4 IUT

JUNIOR PUNCE

COMPUTER **OPERATOR**

tor is required to work ass Learn currently using 1."
4 100 computing system
educational environ-

Although no previousor:

experience is required.x. 🕆 should possess a good.

of English and bear; unclertako goneraloficat : Salary within the left 12998 £3748 inches

Forms returnable with

from the Deputy Senstrative Officer Tell \\ O353 Ext 306

UNIVERSITY OF STRATE

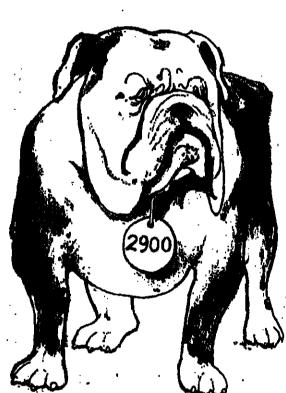
COMPUTER

PROGRAMMER

The posts will invoke project to provide the color of the post of the project project to the project p

Operations Staff

Suddenly it pays to support British industry



Kidsgrove, Stevenage and Letchworth £3000-£6000

Britain's own computer company, ICL, is to clay big international business. The 2900 computer range has not only helped to consolidate the Company's position as the number one computer company in Europe, it has also contributed to the rapid development of worldwide markets. Suddenly, it makes sense to work in operations with one of Britain's technological leaders.

By joining us now you could be involved in the most exciting operations scene in Britain. We operate from two large data centres at Letchworth and Stevenage utilising a total of five large 1900 · systems plus a number of key 2900-based centres.

The transition to the new hardware demands extensive high-calibre operational and systems

We need experienced professionals, both to support present hardware and to push through full transition to 2900. If you have proven experience in some of the following areas we would like to meet you. 2900 training is available in all cases.

- 1900-2900 Hardware
- Plan/COBOL Hardware Planning
- User Support Functions
- Systems Design
- Operating System George 3 VME/8 On-line Systems Development
- Performance Measurement
- Project Control

Support British computer technology. It could make a rewarding difference to your career. Ring Bill Hunt on Stevenage (04 38) 3 361 ext 696 or write to him. quoting reference CW 1084, at ICL, Cavendish Road, Stevenage, Florts SG1 2DY,



COMPUTING

manage use of ellocation of resources. The Computing Service operates a dual processor ICL 2870, and a PDF 11/4B, and in addition makes extensive use of remote computing facilities. There is a substantial and growing provision of interactive computing and communications development. The initial teads will include extending resource control to include an extensive range of perspensionally applications, and the development of charging menhanisms for computer usage.

The past is in the programming grade-(Salary range C3384-C5585 p a.). The starting salary will depend on qualifica-tions and expérience. Applicants should normally posséss à degree, have pro-gramming experience and a keen miss, est in administrative and control pro-adures.

VAN LEER (U.K.) LIMITED Amember of a major international Group of Coming manufacture and development of

INDUSTRIAL PACKAGING SEN. SYST. ANALYST (IBM)

Cobol Programmer £4,500-£5,100 CHIEF PROGRAMMER (IBM)

I two people, preferably with.

binial qualifications in Computer Science
a teckground of linancial and commercial systems with a manufa
1008/vs. CICS and Dig experience

you would file to find out more, including details of staff bonus.
School on Byttes 41161, or write to him at Van Laar House.
West Bytles, Surray.

ARBATIS AT TOUR LEAVE STORY of Brilled Computing and Communications Systems are confused story of Brilled Computing and Communications Systems are confused story of Brilled Computing and Communications Systems are confused story of Brilled Computing and Communications Systems are confused story of Brilled Computing and Communications Systems are confused story of Brilled Computing and Communications Systems are confused story of Brilled Computing and Communications Systems are confused story of Brilled Computing and Communications Systems are confused as a System Systems are confused story of Brilled Computing and Communications Systems are confused as a System System State System Stat

of Companies in the automotive component industry. It is comprised of several subsidiaries, both in the U.K. and Overseas. Continual expansion has resulted from successful business performance over a long period. The group is itself part of Turner and Newall Limited — a major world-wide organisation with interests in the Engineering, Plastics. Construction and Automotive Industries. The company is well sited at Slough in Berkshire, within easy commuting distance of pleasant rural ureas as well as being close to London. Over a number of years the Company has developed

Sales Order Processing

The team working on this new IMS DB/DC Rear-time Database System are currently involved in preliminary system design work for the Slough division of the company. The project has recently been expanded to cover a further division bused in Wales and Hemel Hempstead, and the associated preliminary systems investigation and design work will begin shortly. Detailed systems design work will commence before the end of 1978 and continue

through 1979.
Additional enthusiastic Analyst/Programmers are needed to become involved at all levels of design, programming, user training and implementation.

Manufacturing Systems
In order to react more quickly to variations in customer demand, a fully integrated Manufacturing System is currently being developed to include Inventory Control, Accounting, Material Requirement, Capacity Planning, and Demand Planning to provide an Interface with the Sales Order Processing System. These systems will be supported by IMS Databases covering Bill of Materials Routing and Manufacturing/Purchase Orders. This significant development represents a complete revision of our Production Control System and consequently provides a Production Control System and consequently provides valuable opportunity to join a team controlling and implementing a major reorganisation. We require Senior Analyst/Programmers to assist with the design and implementation of these application systems. They will be working closely with users in developing operational procedures and interfaces within the departments covered

Database Administration

IMS DATA BASE 370/158

a broad range of successful computer systems which are now running on its local ICL installation. Following a group decision to centralise computer hardware, an IBM 370/158 computer has been installed at Group Headquarters and is replacing the on-site machine. To fully exploit the potential of this new machine and to meet the system requirements of our business well into the 80's we are now engaged upon the development of an exciting new generation of systems. The systems, which will embrace Sales, Manufacturing and Financial Spheres of the Company's operations, will utilise advanced Database and Real-time techniques.

Finished Goods Inventory Control

A Finished Goods Inventory Control System is being developed, interfacing with the Manufacturing and Sales developed, interfacing with the Manufacturing and Sales Order Processing Systems, to meet the needs of three unit companies within the group. The system will encompass alt areas of inventory Control including Stock Recording, Forecasting, Replenishment Planning, Perpetual Inventory and Stock Analysis. This complex and sophisticated system, utilising database and providing extensive Real-time facilities using a Ferranti mini computer linked to the mainframe in Manchester, is scheduled for completion towards the end of next year. We are now appeared more the realistications and the end of next year. engaged upon the preliminary system design phase and talented, hard working Analyst/Programmers are required to participate in the detailed design, programming and

Financial Systems

The Project Team is responsible for the design and a implementation of Integrated Accounting Systems which will interface with new Sales Order Processing and Manufacturing Systems: Aspects currently being worked on are Fixed Assets (this five this month) and a comprehensive Management Sale and Demand Statistics System. Due live early next year. Other Systems, at the entliest stages of planning and design include Nominal Ledger, Purchase Ledger, Phyroll and Sules Ledger. These systems will use IMS DB/DC database and online real-time techniques, and are to be implemented towards the end of 1979.

The Company offer an interesting technical environment, developing programs on-line using DB/DC software. Applicants should have a mature outlook, and be keen to accept responsibility; the emphasis being on the ability to join and develop as members of a Project Team, rather than specific

Five weeks holiday, a subsidised canteen, relocation expenses (if necessary), and an excellent starting salary make these positions extremely attractive. If you are interested in discussing your suitability, contact our Recruitment Consultant.

Engineering Components Ltd.

We are a newly established centralised function with three main responsibilities — database development, application project, team support and IMS technical functions. Database development involves long and short term planning design (including security and integrity of data) and implementation of database, together with the control of access to data and the co-ordination of action to implement changes. Application Project Team Support includes initial consultancy on the approach to be used in a database environment, optimisation of database call sequence (including modelling with Dbroptotype) and assistance with IMS problems in testing. IMS technical functions cover a wide range of activities such as recovery and restart procedures, performance monitoring, reorganisation, unload/reload, IMS support, etc.

Myriad Appointments Limited 30 Fleet Street, London EC4Y 1AA 01-353 0981

RPG/COBOL Analyst/Programmers up to £4900 Slough, Berks

ICL's Marketing Division includes a small team engaged on designing and implementing the company's marketing planning systems and an explosion process similar to BOMP, to be run on our own on-site 2904.

We are looking for RPG/COBOL Analyst/ Programmers with experience ranging from 6 months

many and a superior of the best of the control of the second

If you are looking for a challenging position with a major manufacturer, good prospects and excellent working conditions, then we would like to hear

Please phone Karen Holmes, Principal Personnel Officer on Slough 31111, or write to her at ICL, Computer House, 294/298 High Street, Slough, Berks. Please quote reference CW 1083.



UNIVERSITY OF SOUTHAMPTON

Applications are invited for a new post which is being created to develop an integrated system of resource control for all computing teclisies and to manage use of ellocation of resources.

Further particulars may be obtained from Mrs. P. Yaughan Spith. The University Scattleshoots 808 8814. 6 school sophications should be sentially December, 1878. Please quipe ref. 1034/A/GW.

RECRUITMENT SERVICE

ANAL./PROGRAMMERS (COBOL)

PROGRAMMERS (COBOL 8/4

Essex
For details of these and other vacaging in legiFor details of these and other vacaging in legiAnglie ring Karan Burden on Dishiry 4555 (77)
Anglie ring Karan Burden on Dishiry 4555 (77)
Anglie ring Karan Burden on Dishiry 4555 (77)
Anglian D.P. BERVICES LTD, Branch Dishiry
Maldon Road, Danbury, Chelmaton, 1964, 1964
ADW.

EAST ANGLIA Why waste time and money commuting to londered day? Look for a job in rural East Angle away into the hustle and bustle of city life.

Analyst/Programmer £5,100-£5,900 SYST. ANALYST (ICL)

Our UK Constitutor Dept. is widening its programme of cost-ellective the logment with IBM 370 hardware and during the next two years this? Settlement with IBM 370 hardware and during the next two years this? Ichicas II you'd like to join a team that is well motivated, successful and a working closely with its users we'd like to hoper from you.

IBM Teleprocessing Projects at Southampton

Experienced IBM Programmers and Analyst Programmers £4800-£6200

At our new air-conditioned Headquarters in Southampton we run an IBM 148 and IBM 158 (the latter to be replaced shortly by an IBM 3032) operating under OS/VSI. We plan to link around 400 terminals distributed throughout

Programmers and Analyst Programmers with over 3 years' experience of IBM Systems using COBOL or PL/I are required for new teleprocessing development projects using CICS and DL/1, On-line source program maintenance is carried out using ROSCOE.

Benefits include generous holidays, flexitime, a subsidised staff restaurant, paid overtime an excellent relocation terms.

For an application form please telephone our 24-hour answering service — quoting reference number P.109.

PHONE: (0703) 31818

SOUTHERNGAS



Experienced Analysis and Starting Salary up to £5,200 p.a.

The County Council currently operate a 2 megabyte IBM 370/148 Computer. We have a number of vacancies in our systems development seption and if you have at least two

development settlefri and if you have at least two years analysis and/or programming experience (preferably pri IBM equipment); we would be interested in hearing from you.

Cheshird County Council is a leading local authority in the computer lield, and is currently developing a number of varied and technically advanced projects. If you would welcome an opportunity to miden your experience and develop your computing caretr ring Mike. Waters on Chester 602 138 por elfernatively write to the all.

Eystens Control Section, Computing Services. Division: Cheshire County Council, County Hall. Chester.

SALES EXECUTIVES STRAIGHT IRONWARE

LONDON AND THE SOUTH EAST £12,000 + AND COMPANY CAR

> TO SELL AN EXCELLENT RANGE OF V.D.U. AND TELEPRINTER TERMINALS **COMPATIBLE WITH MOST MAIN FRAMES, VERY COMPETITIVELY PRICED** AND READILY AVAILABLE

Our Clients are one of the leading manufacturers of computer peripheral equipment in the world. Their excellent range includes highly competitive VDU and teleprinter equipment which sells very well because of their PRICE, RELIABILITY and AVAILABILITY. These fast moving products are sold both to the end user and OEM markets and require little or no systems involvement.

If you are an established "straight ironware" salesman and identify with the sort of products sold by companies such as ITT, MEMOREX, OLIVETTI, KODE, CASE, and destablished "straight ironware" salesman and identify with the sort of products sold by companies such as ITT, MEMOREX, OLIVETTI, KODE, CASE, and destablished "straight ironware" salesman and identify with the sort of products sold by companies such as ITT, MEMOREX, OLIVETTI, KODE, CASE, and destablished the sort of products sold by companies such as ITT, MEMOREX, OLIVETTI, KODE, CASE, and destablished the sort of products sold by companies such as ITT, MEMOREX, OLIVETTI, KODE, CASE, and destablished the sort of products sold by companies such as ITT, MEMOREX, OLIVETTI, KODE, CASE, and destablished the sort of products sold by companies such as ITT, MEMOREX, OLIVETTI, KODE, CASE, and destablished the sold of the CREED, HARRIS, etc., then we have something very interesting to discuss. If you do not have this experience but feel your background equips you to sell successfully in this fast moving market place then we would be equally keen to meet you.

TELEPHONE BOB BOWER A.S.A.P. TO ARRANGE A MEETING. DO IT SOON, YOU HAVE NOTHING TO LOSE AND A GREAT DEAL TO GAIN!

HUTTON EXECUTIVE SELECTION LTD. HUTTON HOUSE, **HUTTON STREET, LONDON EC4Y 8HR**

TELEPHONE: 01-3537141 (24 HOURS)



ng background preferred plus experience of DATA PREP SUPER London W

COMPULECH O1753 0202

Staffordshire Area Health Authority

NORTH STAFFORDSHIRE HEALTH

COMPUTER STATISTICIAN

Mr. A. M. Nash, Director of Computing Services North Staffs Royal Infirmary Princes Roed, Hartshill, Stoke-on-Trent Td. 0782 49144, ext. 4840

Senior Project Leaders: Come to Croydon with **Real Time Mini for** up to £8.5k

Plus generous relocation expenses if moving your job means

Plus ample opportunities for European travel.

Plus promotion prospects as bright, if not brighter, than almost anywhere else — if only because this Company is all kinds of communication systems, all big.

Once ensconced in Croydon, your future is very rosy, and could include anything, communicationswise, anywhere in the U.K. or Europe, the Company is that well thought of.

Project leadership OR communications OR good (what other kind is there) Real Time Mini/Micro experience, plus an appropriate degree is what you need.

Sex? Either is nice.

(SHOPEROOR DATA COLLECTION)

ON QUOTA EARNINGS 15K

-QUALITY*CAR

AREA MIDLANDS & THE NORTH

SCR is retained to recruit a Sales Manager for DATA PATHING (UK) LIMITED: This young, highly successful Company is an autonomous member of a well-known International Computer Manufacturer.

Within the shop floor data collection market, DATA PATHING supply tailor designed

A ground floor opportunity exists to join an embryonic Company which has a

Candidates should have above all, an engineering background being capable of reacting to shop floor needs and a market appreciation for this industrial environment, coupled with a proven success in selling.

SPECIALIST COMPUTER RECRUITMENT LIMITED

RIRMINGHAM 021-236 5761 Fraepost, Basty and Litt House, 35-37 Greet Charles Street Gueenstery, Birm

MANUFIRSTER On ASS 0427

CONTACT: RICHARD CHAMPION, 021-236 3781 (24-hour answering service)

hardware and software to customer specification.

distinguished track record to date.

For further details dial 01-836 9719 or 9882 and ask for Beryl



Computer Appointments (Real Time Mini's Place) Suite 43, 12-13 Henrietta Street.

> Burroughs Computer Operator

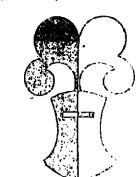
The International Systems Division of American Express based in Brighton is seeking an experienced Burroughs Operator for its B.1860 which is

A successful candidate will have upwards of 12 months experience on a Burroughs computer and be prepared to work on a Write, giving brief details or phone for an application form to: Dennis Perfrement. Central Personnel

Edward Street Brighton, Tel; (0273) 693555 ext. 6512.

AMERICAN EXPRES

OPERATORS



CONTRACTS MIDLANDS & N. ENGLAND

IBM

PL/1 PROGRAMMERS C. £220 Midiands, North West, Bristol COBOL PROGRAMMERS . c.£220 Scotland, North West IMS PL/1 PROGRAMMERS C.£230

Midlands, North West CICS ASSEMBLER PORGRAM-MERS c. £245

CICS DL/1 PROGRAMMERS

Midlands c. £245

1900 PLAN PROGRAMMERS 2960 VMEB/FORTRAN PROGRAM-

1900 GII/III COBOL Programmers Midlands, North West, Scotland



OTHERS

HW L66 IDS/TDS PROGRAMMERS North West C. £250 HW L66 GCOS/COBOL PROGRAM-MERS c.£225 Yorkshire, North West, Midlands HW L66 COBOL PROGRAMMERS Scotland C. £220 PDP DIBOL PROGRAMMERS North West C. £220

PDP RSXII PROGRAMMERS Midlands, North West . . C. £230



PERRY BUTLER ON 061-833 9341/5

Knight Programming Support Limited

143/144 ROYAL EXCHANGE MANCHESTER TELEPHONE NO. 061-833 934 178 MIDLANDS 021-238 1784. Extension 228

PAYOR TREATMENT OF THE PROPERTY OF THE PAYOR TO THE PAYOR THE PAYO

SEMBLE REST

a unital our - Cou Pries

Our client is a major organisation providing comprehensive marine engineering and construction in hydro carbon development. Retaining IBM 370 under DOS/VS they seek

systems programmer with minimum 3 years

Selection of projects

Variety of projects

English-speaking environment

Free accommodation and cost of living allowance (varies according to marital

SOFTWARE & COMMUNICATIONS

Would you like to join the Dutch sub adiary of a world leader in the Min. I Micro Communications. Measure solary of a word react in the minitial Micro Communications. Measures Switching and Soltware held? The company lised is a British based international group with offices in the continents. They specialise in the supply of Bestellar Limitian states of the Bestellar Limitian sections.

development than you must give sendes consideration to these appointments. Our client believes in shift. Project metching, you will never sked to work in an area unfamilier



timents. They specifies in the supply of Bespoks turnfay systems besed on Mini and Micro processors specifically in the Communications Message Switching, network, Process Control and basic software fields Any assembler language is desirable. To ment their expansion goels they are receiving numerous additional specialist project teams requiring Consultants, Project and Team teaders, Analysis and Programmers at various levels, specifically at 5 years plus by 2-5 years of Teamers up to 2 years til the idea of working at the sharp and of sophisticated technical computer proneering appeals and joining a very pressignous carepany is messurgful to your carest development them you must give development them you must give





WELL GIVE YOU MIDLANDS

THE REPUBLICATION OF COME OF THE PARTY OF TH

Realistic Salary + Benefits



This is a new appointment creating an unusual opportunity for career development. Applicants ideally should have 2/3 years Teleprocessing experience particularly in the use of T.P.S. on 19m. hardware. The Person will be responsible for a small team and be involved in working with and influencing user departments. N.B.C. Computer Services, through successful planning and implementation is an expanding and developing company. Personal development is strongly encouraged with full support of continuous training — promotion is solely by merit and is determined by your efforts.

Find out more about this position by telephoning our Manchester Office quoting reference: CN 47-8MC

Interviews will be held in Birmingham.

CAPP ASSOCIATES Societion LONDON AND MANCHESTER

061 236 9085 FAULKNER HOUSE FAULKNER STREET, MANCHESTER, M1400

EXCELLENT OPPORTUNITIES FOR CONTRACT STAFF

In line with current expansion plans we will be pleased to hear from programmers, analysts and consultants of professional disposition with a solid background in any of the following disciplines:

> FORTRAN MARK IV COBOL BASIC RPG PL/1 BAL

and any DATABASE or TP MONITORS

Forthcoming internal projects include developments on in-house equipment. Current external projects cover U.K., Europe, U.S.A. and the Middle East.

Please telephone or send career details to: MARGARET DRISCOLL

TANGENT COMPUTER SERVICES BROOK HOUSE, 4 EASTERN ROAD ROMFORD, ESSEX RM1 3PJ

TEL. ROMFORD 0708-44181/2

Top contract fees

COMPUTER SERVICES

Overseas

Senior IBM Systems Programmer

A major industrial group, based overseas, needs an experienced senior-level Systems Programmer to act as Technical Support Supervisor on its sophisticated IBM installation.

- Your responsibilities will include:
- * Planning and conducting training programmes for systems development and operating staff.
- * Optimisation of software environment.
- * Creation and maintenance of source programme and documentation libraries.
- * Development of Installation standards.
- * Software performance measurement techniques.

You will have had at least five years' DP experience, two of which will have been spent in systems programming in an IBM DOS/VS installation. Your technical appreciation of both IBM hardware and software will be coupled with a thorough knowledge of DOS/VS, CICS/VS and POWER/VS (or GRASP) and familiarity with the design, programming and maintenance of software and software standards. You will also have

been involved in training. Salary will be up to 100% more than your current earnings. Benefits include free furnished accommodation, and assistance with school fees, car purchase and medical costs.

Please write-with details of qualifications, experience and current salary, and quoting Ref. 179, to: Mr. A. Cook, Grafton House, PO Box 214, 🦂

which is now putting into effect a forward looking development plan incorporating a credit-unit approach combined with a self-learning system. The basic teaching departments are organized into three Divisions — Engineering, Applied Science and Commerce & Design, and broad lister disciplinate content and learning. and broad, inter-disciplinary centres and Institutes — Toxtile & Clothing and Medical & Health Care — which are The Polytechnic invites applications for the following

sts which are tenable from 1st September, 1979: **Department of Computing**

Science Principal Lecturers/Senior Lecturers/Lecturers

in Computing Science (Preference will be given to applicants with interest in one or more of the following subject areas: Management Information Systems, Computer Graphics, Computer Education in Secondary Schools, Computer Assisted Instruction, Systems Programming and Application of Computers in inventory control, production control. banking, insurance, hospital systems and all disciplinus taught at the Polytechnic; e.g. Engineering, Mathematiks. Toxtiles, Design and Commercial subjects.)

General Qualifications for Appointment

Principal Lecturer: (a) a dogree or professional qualifications; and (b) an advanced specialist qualification or extensive experience in a specialised field; and (c) substantial teaching and industrial/commercial oxperience; and (d) proven administrative ability Senior Lecturer: (a) a degree or professional qualifications; plus preferably an advanced specialist qualification; and (b) at least five years' professional experience; and (c) substantial teaching and / or industrial / commercial experience (about three additional

Lecturer: (a) a degree of professional qualifications or at least a Higher Technician qualification in the appropriate field of study; and (b) at least five years' professional or industrial/commercial experience or at least three years' teaching experience or a suitable combination of professional and teaching experience.

Salary Scales: HK\$ 98,220 to HK\$ 121,200 p.a.

Senior Lecturer: HK\$ 79,980 to HK\$ 107,340 p.s.

HK\$ 44,220 to HK\$ 79,500 p.a.

Note: £1 = HK\$ 9.65 on 26th October, 1978. (Commencing salary will be commensurate with qualifications and experience.)

Conditions of Service

Appointment will be on two-year gratuity-bearing contract terms initially. Thereafter suitable appointees may be offered further contracts or superannuable terms of service at the discretion of the Polytechnic. Benefits include long leave; free passeges; subsidised accommodation; medical and dental treatment; children's education allowance; and a terminal gratuity equal to 25% of basic salary received over entire contract period. over entire contract period.

Application forms and further information are obtainable from the Hong Kong Government London Office, 6 Grafton Street, London W1X 3LB; U.K. Completed application

CONTRACT PROGRAMMERS urgently required with the following experience

IBM 370 RPG II Burroughs 6700 COBOL IBM MTCS

Top rates - weekly paid

Focus Computer Services (Emp. Agy.) 28a Devonshiro Street, London, W.1 Tel: 01-487 5781

EUROPE

THE GEMINI CONTRACT STAKES TALK STRAIGHT TO THE HORSES MOUTH

or at least to the right end of the horse

We are the U.K. Company of the Cap Gontini Sognti Group, Europe's largest software services operation.

We have routine daily contact with 50 branches operating in 14 different European countries.

Why complicate things by dealing with middlemen? Come and register with us for first class deals in Europe and the

Phone Pat Forde on 01-828 6634 (daytime) or 01-223 6713 (evening) for further information and starting



COMPUTER PERSONNEL APPOINTMENT Carger Specialists and Cottal ANALYSIS D.P. MANAGERS, SYSTEMS ANALYSIS PROGRAMMERS AND PROGRAMM

SYSTEMS AND PROGRAMMING OPPORTUNITIES

★ JOB SATISFACTION ★ CAREER PROGRESSION ★ GOOD SALARY

胸腺群 智能流畅特别的的秘密诗题。 - 湖. 属印度原列的 Big Site Buffang

WHY TRAVEL to central London? Major group of companies based close to the N Circular seeks programmers with MINI ASSEMBLER experience to work on real-time ormation and control systems on PDP I equipment which runs under RSXII operating systems. Small project teams encourage involvement at all stages, thus giving design experience and user contact. Company offers: Friendly atmosphere working in a small

group Excellent promotion prospects Discount on company products Sports and social club

MIMI RECESSOR.

重确的特殊

\$10 \$16 1.1.16A

Prestige company operating on a global scale

are now recruiting programmers with at least 2 years' experience on ANY MINI ASSEMB-

LER to work in their new modern offices. Having large DEC PDP II equipment and

expanding at a rapid rate, they have a wide range of on-going projects both in hardware and software. Co. offers:

RSXII. RTII and RSTS

Opportunity for overseas travel EXCELLENT TRAINING opportunity in

Extensive training in up-to-date technology REF. 1940

mpany. Co. offers. RELOCATION EXPENSES if required Life Assurance, Pension and sickness Super training opportunities

TRANSPORTS

49. 高级的通行/许法语言

TEN TIS LIGHT

International group of companies with out-

standing reputation for efficiency growth and investment sooks programmer to work on a

variety of new projects. Ideal applicant will have at least 12 months' IBM programming experience of ANY HIGH LEVEL LANGUAGE Lots of super training opportunities and career progression is structured and rapid within this

Excellent working conditions

3493

·爱尔克斯特 不 100克克

Multi-national conglomerate company are seeking a systems programmer to undertake full systems reaponability of their IBM 370 hardware. Applicants will have good technical background with at least 2 years ASSEMB-LER preferably with COBOL or PL/I, running under either DOS or OS. This is an excellent

opportunity to join the organisation at senio levol Co offers EXCELLENT working environment. FREE

lunch and BONUS Socurity in a growing organisation REF 1938

Sports and Social club

AND SET FOR BUILDING ADDRESS OF

THE PROPERTY OF THE PERSON

和野洲海鲂

Our client is part of a major international corporation with business interests throughout the world. Retaining IBM 370 (due to be upgraded shortly and with plans for new

equipment and development) seeks pro-

grammers and analysts to join their compute services team in modern offices on the south

Non-contributory pension scheme Mortgage subsidy Flex-hours

人名西勒维维

Exciting and CHALLENGING opportunity awaits a systems analyst within this world wide and prestigious company. Ideal appli cant will have a programming background in COBOL and/or ASSEMBLER, and at least 18 months' experience as a systems analyst. Our client is awaiting the installation of a NEW IBM 370 in December and this is a super opportunity to work in a brand new area or now projects. Co. offers.

Stimulating and satisfying programming positions at varying levels exist within major travel organisation based in Southern England. On-line applications relating to stock control, forward planning and scheduling on their IBM 370 installation and applicants

should ideally have 2-4 years' IBM COBOL experience perhaps with PL/1. Having a large TP network, a distinct asset would be a knowledge of teleprocessing and database techniques — although training can be given.

PROGRAMMERS

MIDDLE EAST

G. £12.000 YAX FREE

We would like to meet computer professionals on behalf of our clients with around 4 years' ICL 1900/2903 experience to discuss

Prestige company
Accommodation and expenses paid by

Idle East Co. offers:

Scope in a variety of areas

。如何可能的數字數**個AE**YSEE

- Super working environment Excellent career opportunities

BOOK SPERMAN - - 319 TE ant with talking (4) (海洲) 胞肿的形式的抗病的

Open to married and single persons

An exciting opportunity for ICL COBOL programmers with proven track record to move into challenging and rowarding role. The company is a prestige British Banking organisation currently retaining ICL 1900 but with a 2960 scheduled for delivery mid-1979. The position will initially be involved in the continuing development of an existing commer-cial project followed by all new development work on 2960 Co. offers:

Subsidised mortgage Non-contributory pension, free BUPA and life assurance. Season ticket loan scheme

REF. 1885

REF. 1934

電腦調整的機能 网络特别亚洲 Address of the Marie Co. - 11.19家港の場合

Our client, one of the world's leading sup-Our client, one of the world's leading suppliers of high technology products and services to world wide energy and industrial markets, are seeking a trainee analyst programmer. If you have 12 months' COMMER-CIAL Cobol programming experience this is a fantestic opportunity to be trained in analysis. They have a large TP network with links to Europe and offer full training in database and UP. Co offers:

5 Fantestic job opportunities

Fantastic job opportunities Excellent prospects for promotion TRAINING in ANALYSIS, TP and DATA-

FERROGULATION MER

HOLLAND

£11.000 circa

Unique opportunity exists within international

company dealing with household and indust-nal products. Based in Rotterdam the organ-isation retains IBM 370 use COBOL under DOS. CICS/VS with the use of DL/I. Pro-grammers and analyst/progs. required to assist in the development of on-line commer-cial and financial systems. Candidates should

have 2-3 years' COBOL experience. Co.

8% vacation allowance and 6% profit

★ RELOCATION expenses

English-speaking company

REF 1802

REF. 1881

Prestige organisation providing services to British banking industry requires systems analyst to become involved in the implementation and continuing development of large on-line communication system. Ideal can didates should have programming back-ground, experience of working in operating system environment with TP biss and able to play a major role in the design and molementation of an on-line transaction processing system. Experience of ICL hard-were an advantage. Co. offers:

Mortgage subsidy Non-contributory pension scheme Personal loan scheme RELOCATION EXPENSES

Pridgrammens — Essex

£5.500 NEG.

Management services division of major

British group with annual turnover of almost £1000m seek COBOL programmer with

within a project team Programmers with become involved in program design, coding, testing and documentation as well as assist-ance in systems implementation. Co. offers:

Comprehensive range of applications RELOCATION if required

ninimum 2 years' IBM or ICL COBOL to work

Superb opportunity awaits programmers with proven track record to improve his / her career prospects. Reply immodiately if you have IBM 370 PL/1 experience (preferably with some database — but exp. not essential) for our client a major UK organisation. A wide range of simulating projects exist in a commercial and financial environment. Co. offers:

Good career path within a well-structured

Ça. affers: Excellent working conditions in a friendly atmosphere Training in TP and Database where

REF. 1939

Perks include travel concessions

Excellent perks include SUBSIDISED MORTGAGE

REF. 1920

Junior Systems Analyst — London to £6.500 . + SUB MORTGAGE

Major British insurance company with assets exceeding £440m seeks persons with minimum 12 months' experience of systems analysis and design covering major aspects of systems work, preferably with an ICL COBOL programming background. Company has well planned future including delivery of ICL 2960 next year running under VME/B and covering projected development work. Co. offers: EXCELLENT early prom

* FULL 2900 training FLEXI HOURS, FREE lunch, BONUS. Annual REVIEW, sports and social club REF. 1849

For further details please ring or write to our London Office: 01-734 0152/3010 (24 hours)



KNIGHT PROGRAMMING SUPPORT LIMITED

27 NOEL STREET, LONDON, W.1: TELEPHONE 01-734 0152/6 (24 HOURS) OFFICES AMSTERDAM PARIS MANCHESTER BIRMINGHAM







Data Processing Recruitment Consultants

Real Time Programmers Scandinavia & Spain

Salary: £14K plus benefits.

The leading Scandinavian Systems and Turnkey recent or current experience on UNIVAC 490/4, Supplier with offices in Scandinavia, Nigeria and California requires FORTRAN and/or ASSEMBLER programmers for its flome based and Spanish operations. Whilst the applications under develop-ment are sophisticated Real-Time projects previous experience of Real-Time is not absolutely essential but in-depth FORTRAN and ASSEMBLER programming expertise is a pre-requisite. Preference will be given to those candidates who have very

UNIVAC 1100 series or IBM 370. Willingness to relocate to Scandinavia or Spain for

an extended period is absolutely essential and to assist you in your removal our client will meet all relocation expenses in addition to providing initial interviews will be held at our London offices in late

November and early December.

Micro Processor Specialists Rural Thames Valley

Salary: £6.5K - £8.5K

A small but rapidly expanding Micro based System supplier has very recently established new Head-Quarters in rural Oxfordshire.

The company is now seeking several Micro or Mini Computer Specialists with 12 months or more practical applications or software development/ design experience in either a computer manufact uring or software systems house environment. If

Those who have Assembler or Basic language experience on Mini or Micro hardware particularly DEC PDP 11, DG Nova/Eclipse and T.I. 900/990 or Micro-Processors preferably Zilog Z80, Intel 8085/6 or Motorola M6800 will be ideally suited. In addition to above market starting salaries our client offers excellent career advancement you have relevant experience we invite you to discuss your career advancement prospects with U.K. and Western Europe.

Process Control Specialists West Germany

Salaries to £15K

Much of the forefront development in Process spheres of activity. In particular, extensive Mini Control Software emanates from Western Europe and if you aim to move into frontier technology the opportunity arises to join a highly reputed Systems and Software Development Group engaged in exciting pioneering projects in the areas of:
Robotics, Artificial Intelligence, Industrial Control Systems or Liquid Flow Monitoring Systems.

Existing and new project teams-require Consultants, Systems Designers, Senior Analysis, Analysis Programmers and Programmers with direct and relevant experience in at least one of the above permanent housing.

Computer Assembler is essential, and a degree or

equivalent would be an advantage.
You are certain to contribute valuable expertise to this prestigious group whilst expanding your own threshold of experience through working closely withotherprofessionals at your own level. Our client will pay full relocation expenses for you and your family and provide a generous resettlement advance in addition to meeting the costs of temporary accommodation pending location of

Burroughs Programmers and Analysts Netherlands+Belgium

Salaries: £12K - £15K

ment teams in early 1979.
Both installations have BURROUGHS mainframes and consequently it is a pre-requisite to offer B3700 B6700 experience either as a Programmer or Analyst. These positions represent an outstanding opportunity for those who have had exposure to Financial, Commercial and Banking applications.

An important Banking Institution based in Benelux and having one installation in the Netherlands and its Head-Quarters in Belgium requires PRO-GRAMMERS and ANALYSTS to join its Development learns in activities. one of the two installations and be expected to integrate into the work and social fabric of the local accommodation allowances will be paid, language luition courses are available for all employees and their families.

Whilst we will conduct initial interviews, you will spend one day at the Company's Head-Quarters of course at its expense - for further interview and

Database Project Leader Kuwait

C. £16K (Tax Free)

The successful candidate will be required to demonstrate current programming and design exposure in the implementation and support of Data Base and/or Real-Time Systems, particular involvement with IBM's own software IMS, CICS, TSO or the products of the independents, namely CINCOM's

We are requested to recruit a Project Leader (Ideally 27-35 years) offering an in-depth knowledge of both Data-Base and Teleprocessing techniques in an IBM should have included PL/1 or COBOL programming and design and analysis experience within a

financial or commercial environment. Supplemental to a high salary you will receive additional benefits including married or single status accommodation, full relocation expenses, life and disability insurances.

Fiot:34/E

[R-1_]4_0

Logistix, Freepost 32, London WIE 3YZ Telex 28800

Avon House, 366 Oxford Street, London WIK 9HA

INTERMATIONAL BANKING COBOL PHOGRAMME

- - Calary op to £5,000
- Free Life Assortance Season help the form.
- * Interest of Mortgage

 * Interest of Mortgage

 * Interest Cours of 4% Available

An outstanding and exciting opportunity for a Cobol Programmer in this shortly to be explicitly system 3715 installation which is part of a global OP Banking System

Applicants should have a maximum of 18 months. COBOL exportence, financial applicator.

The applications involved will be Batch and On-Line systems

This position offers excellent frieign benefits and the appartment to play an important roleing DP Department. The successful applicant will report directly to the D.P. Manager,

BOBBY McCORMICK, DIRECTOR on 01-603 7335/01-602 4851

Highire Handstein Bland 58 Pembroko Road Lundon Will Falephone Ol-603 73358 http:// Computer Services & Recruitment Consultants.



H.N.C. in Computer Studies? or Computer Experience?

This is an excellent career opportunity for a young man or woman, preferably with H.NC qualifications in Computer Studies, to gain wide ranging programming experience who the Scientific Computing Section of The Wolfronio Research Laboratories, Berkhamste

Main responsibility will be the dovelopment of systems to handle data generated by the Laboratory's Toxicology Section on a PDP 11V03 and to provide a trial/data management system on an IBM 370

Knowledge of FORTRAN is assential and a knowledge of PDP MACRO would be an advantage. After initial comprehensive training increased involvement in other systems

The Laboratories are part of The Wellcome Group Research and Development and are concerned with veterinary pharmacouticals and control of most posts. They are situated on the outskirts of Berkhai

We offer an attractive salary and first-class benefits include generous assistance with relocation expenses, where appropriate

If you are interested, please write or telephone for an application form, quoting $oldsymbol{\alpha}$

A. J. Morris Site Personnel Officer The Wellcome Foundation Ltd. Berkhamstad, Horts

Tel: Borkhamstud 3333 est. 363



G. £6500

G, £7500 SYSTEMS PROGRAMMER S. Beds. to £8000 London & S.E. TECHNICAL SUPPORT

Good exp. of Op. Systems or T.P. or Database. (Poter)

TRAINEE ANALYSTS Snr. Progs. to train for Major Co. (David). PROGS. or PROG./ANALS. Any COBOL or PL/1 for IBM 370 (Bill) S. Beds.

SENIOR ANALYSTS Central London ANALYST/PROGS.

BUSINESS ANALYST West London PROGRAMMERS West End

SALES SUPPORT London & S.E.: Maintrame and Mini areas. Good technical background. (Peter).

ANALYST/PROGRAMMER SW1
On line exp., some RPG II for new installation. (Dayld).

TELEPHONE: 01-839 6087 Bill Taylor, Peter Barson, David Ward Barnard, Davies a war like Computer Personnel Code and 107 Jerniya Street, London W

DAVIES & WARD LTD



Greenock House 19 Cuckfield Road Hurstpierpoint Sussex

Telephone 0273 833848

SPECIALISTS IN DP AND EXECUTIVE RECRUITMENT

HEAD OF PROGRAMMING SERVICES SURREY, C £6300

Our client is a well-known manufacturing and marketing organisation who are a leader in their field. They have successfully operated computers for some years and have developed sophisticated applications using on-line facilities for local use. They now wish to appoint a mature person to HEAD THEIR PROGRAMMING SECTION. The vacancy will probably suit a SENIOR PROGRAMMER who has

- Around three years + solid programming experience ANY HARDWARE, ANY LANGUAGE.
- Reached the point in their career where they now feel ready to accept responsibility and greater challenge.
- Ambitions to remain in the main stream of programming.
- Ideally some background of real-time or on-line computing.
- A desire to express his / her own ideas and put them into practice.
- Some supervisory experience looking after a small team of programmers
- Accepted the necessity of being judged on achievements and rewarded by personal performance.

This is an outstanding opportunity for the right person to up-grade his / her career in a positive fashion. Prospects open up the possibility to become DPM in time. In appropriate cases relocation expenses will be paid.

> PLEASE WRITE TO US OR TELEPHONE US NOW IN ORDER TO MAKE ARRANGEMENTS FOR IMMEDIATE INTERVIEWS TO TAKE PLACE EITHER IN LONDON OR THE SOUTH

IF MORE CONVENIENT TELEPHONE: JACK COLLINGS, OUR MANAGING CONSULTANT, BETWEEN 7 P.M. AND 9 P.M. ON (0273) 833120

RECRUITMENT AND CONSULTANCY SERVICES LIMITED

Greenock House 19 Cuckfield Road Hurstpierpoint Sussex

Telephone 0273 833848

SPECIALISTS IN DP AND EXECUTIVE RECRUITMENT

CENTRAL LONDON

PROJECT MANAGERS/CONSULTANTS SYSTEMS ANALYSTS/PROGRAMMERS **SALARY CIRCA £9,000 PER ANNUM** SALARY CIRCA £7,500 PER ANNUM

OUTSTANDING OPPORTUNITY FOR YOU TO ADVANCE WITHIN A VERY DYNAMIC AND PROFESSIONAL ENVIRONMENT

Our clients are the U.K. leaders providing services in the Banking. Financial and Commercial fields.

The demands being placed upon them by their clients have necessitated the need for us to assist them in identifying top quality

PROJECT MANAGERS CONSULTANTS

Do you match the following requirements:

We are looking for people with above average ability to fill these roles. In return we should expect you to

1. Portray the level of experience to enable you to undertake a variety of projects related primarily to the Banking, Finance and

Have the ability to motivate and lead others in satisfying user needs.

Possess experience gained from working with mainframe or mini hardware and software.

Convince us that you can undertake levels of responsibility and identify business solutions as well as effect these.

SYSTEMS ANALYSTS

To satisfy the needs of our clients you will:

Possess a sound programming background.

Have progressed into Systems Analysis with the ability to work well with users.

Went to progress your career in an environment offering you maximum opportunities.

Preferably be able to demonstrate leadership qualities.

Any programmer experienced in either low or high level lariguages wishing to take the next step forward in his her became should talk to us and in Joing so hopefully be successful in widening their experience and gaining further progression.

PROGRAMMERS

PLEASE WRITE TO US OR TELEPHONE US NOW IN ORDER TO MAKE ARRANGEMENTS FOR INTERVIEWS TO TAKE PLACE AS SOON AS POSSIBLE IN LONDON OR THE SOUTH



Edmund Howard's Client Album

AVIONICS/SCIENTIFIC PROGRAMMERS

COBOL PROGRAMMERS

Spiaries £4-£6,500

PROGRAMMERS CONSULTANTS

SENIOR PROGRAMMERS ANALYST/PROGRAMMERS

TECHNICAL AUTHORS

Edmund Howard & Partners Computer Personnel Consultants

5 Brighton Road, Surlyton, Surrey Telephone 01-399 9183.
38 Grafton Street, Dublin, Telephone 775,756.

Programmers and Programmer/Analysts

JOIN THE CHAMPS

YOU'VE HEARD ABOUT IT IN THE TRADE \dots AND, DR. WHO SWITCHED THE FIRST ONE ON AT THE LONDON PENTA HOTEL JUST LAST JUNE AND THE SUCCESS HAS BEEN ACCLAIMED WORLD-

The success story continues . . . Orders for the CHAMPS system have just been placed by two of the largest hotel firms in the UK and Europe and enquiries are flooding

Here's your chance to do something excitingly different with your career and at the same time join in our

- New on-line language MIIS
- Computer Assisted teaching
- Medium and large-scale minis
 Interesting Applications

Marcol's Hotel Systems Division, a small but very competent group of business systems specialists, require additional programming staff to expand their services to both U.K. and European hotels. Applicants must be able to work to a high standard whilst closely involved with the users and be willing to work at a transfer of the programming staff to expand the willing to work at a service of the programming staff to expand their services to both U.K. and European hotels. with the users and be willing to work at a variety of locations when required.

If you have at least three years' experience programming in any high level language and entitle working and learning with the really top level specialists in your field please do apply not

Those applicants who have also in their background experience of any of the following are especially welcome to apply:

- On-line or real-time commercial systems
- Mini or mainframe business terminal systems
- Hotel, booking, or reservations systems
- MUMPS programming systemsTechnical French or German
- FOR FULL DETAILS OF THESE AND MANY MORE PROGRAMMING OPPORTUNITIES RING OR WRITE: DEREK ASHLEY OR PENNY BAILEY

* Computerised Hotel Accounting and Management Processing System



RECRUITMENT AND CONSULTANCY SERVICES LIMITED

Greenock House 19 Cuckfield Road Hurstpierpoint Sussex

Telephone 0273 833848

SPECIALISTS IN DP AND EXECUTIVE RECRUITMENT

DO YOU CONSIDER YOURSELF TO BE AN ABOVE AVERAGE SALESMAN?

LONDON BASED

If you do, then we wish to talk to you about an exciting opportunity with a .company who are new in the U.K., but world-wide, have an excellent sales record in Real Time Mini Computer Systems.

THERE ARE NO LIMITS TO EARNINGS AND A GOOD BASE SALARY WILL BE OFFERED PLUS A GUARANTEE in the case of a successful Salesman plus a car. Our clients are looking for real opportunists who really mean to sell and go places. We would like you to telephone us the moment you see this advertisement so that we can discuss with you how this opportunity can provide you with a rewarding and satisfying career

SURREY (NEAR GUILDFORD)

PROGRAMMER COBOL

Salary circa £6000

Our clients are going through an exciting phase of development and wish to recruit a young and energetic programmer who will join their existing team and be capable of developing into their sophisticated systems applications. A programmer of two years' standing with some knowledge of systems would be preferable. If that person had been involved in the development of minis, this would be very desirable. The main emphasis is on the person as both the personality and attitude towards solving business problems is vitally important. The opportunity is a challenging and rewarding one and you will be working in modern and comfortable conditions. We would like to discuss your career with you immediately so that we can tell you how this opportunity can fit into your career plans.

LONDON (WEST)

ARE YOU THE PERSON TO FILL THIS SOFTWARE ROLE?

SOFTWARE SYSTEMS MANAGER

Salary circa £9000 according to experience

We are acting for clients who are developing sophisticated environmental test equipment. The person they are seeking will be in charge of the computer control of a wide range of special test systems.

The requirements are as follows:

- 1. Experience in the software development of PDP or GEC 4000 or real time microprocessor. control systems.
- The ability to negotiate with outside software organisations and co-ordinate their activities.
- The ability to motivate and communicate at all levels.

The appointment is a progressive and challenging one and the candidate selected will be joining one of the foremost companies in this field.

OUR TELEPHONE NUMBER IS HURSTPIERPOINT (0273) 833848 AND WE HAVE A 24-HOUR ANSWERING SERVICE



COMPUTER WEEKLY, November 16, 1978

Computer Recruitment A division of ATA Selection and Management Services, recruitment consultants to industry and Commerce since 1962

LANCASHIRE/ YORKSHIRE

SENIOR COBOL PROGRAMMERS

North Mancheste £5,500 p.a.

A large retailing organisation is upgrading its installation to a 2980 and requires good COBOL Programmers to lead teams in a complete rewrite of all systems using FILE-TAB. PLAN and various software packages. This is a 3-4 year project where opportunities for advancement are significant. The working environment is excellent and a staff discount is offered on all merchanise.

JUNIOR SYSTEMS PROGRAMMER

Central Menchester around £4,000 p.s.

A leading engineering company need a bright young graduate to join a team and to be educated into a full Systems Programmer. The successful candidate will have software expenence preferably with some understanding of assembler. This is a superb opportunity to increase knowledge within an expanding environment.

ANALYST PROGRAMMERS

West Yorkshire to £6,000 p.a.

Due to a departmental restructure this large subsidiary company manufacturing toilstries is looking for two Analyst Programmers to develop and maintain systems on an IBM 370 mainframe, PDP 11/70 and 11/34 minis using CORAL. The main projects include automated warehouse system and process control. The main projects include automated warehouse system and process control using Total Database. Candidates should have 18 months commercial programming experience in any language. The offices are in a rural area, served by a good public transport system and fringe benefits such as subsidised meals and staff discount on all company products apply.

For further details of the above positions or an informal discussion as to how you can advance your career telephone 061-832 5856.

ATA COMPUTER RECRUITMENT ANGLIA HOUSE, 86 CROSS STREET, MANCHESTER M2 4LA

MANCHESTER (061) 832 5856 BIRMINGHAM (021) 643 1994

BRISTOL (0272) 211035 36/38 8aldwin St. 851 INR

Anglia House, 24/26 Frederick St. 36 The Broadway

EDINBURGH TRAINEE SYSTEMS **ANALYST**

Our clients, a major Scottish rotall organisation, wish to recruit a trainee systems analyst for their computer installation in Central Edinburgh

This is a rare opportunity to gain valuable experience of a with variety of continercial applications

The ideal applicant should be aged 22/26, have a degree or equivalent qualification and at least 12 months' commercial experience as a programmer of junior analyst

The selary is negotiable, around £4,000 and the fringe benefits include generous staff discounts subsidised canteen facilities and attractive pension scheme.

For further information Tel: 031 2265381 or write in confidence, to H. W. Clark, Esq., ATA Computer Recruitment, Anglia House, 26 Frederick Street, Edin-

WEST

COUNTRY

Our clients are recognised world wide for their high technology products and are based in the West Country. They are shortly taking delivery of an IBM 3032 to enhance their present IBM 370/168 installation. They

therefore need additional programmers and systems analysts at all levels of experience in COBOL. JCL.

The company's offices are situated in a rural part of the West Country, 25 miles from the costs and close to several areas of outstanding natural beauty.

The salaries for these exceptional opportunities are detailed below and in addition a PRODUCTIVITY

BONUS of up to 10% is payable.

PROGRAMMERS £4,500+P.B. = c£4,900

SENIOR PROGRAMMERS £5,262+P.B. = c£5,738

PROJECT SENIOR PROGRAMMERS £5,857 + P.B. =

LEAD PROGRAMMERS £6,467 + P.B. = c£7.052 SYSTEMS ANALYSTS £5,262 + P.B. = c£5,738 SENIOR SYSTEMS ANALYSTS £5,857 + P.B. =

PROJECT SENIOR SYSTEMS ANALYST £6,457 + P.B. PROJECT CO-ORDINATORS £7,253 + P.B. =

Re-location assistance available and is variable according to the position for further details ring: 0272 211035 or write enclosing a detailed c.v. to ATA Computer Recruitment, Equity & Law Building, 36/38

MARTINS COMPUTER SERVICES

The D.P. Recruitment Specialists for the Midlands/West Country areas

MIDLANDS/WEST COUNTRY

MANAGEMENT PROJECT LEADERS SYSTEMS ANALYSTS

SYSTEMS MANAGER, at least 5 years experience in D.P. with IBM Systems 3 Hardware using RPG II. Area Stoke-on-Trent Salary to E6K. Ref. M.28 PROJECT LEADER, at least 5 years in IBM Systems specialising in Financial applications. Area Birmingham. Salary to £7K. Ref. SA185
SYSTEMS ANALYSTS, 2 years plus experience using On-line and Batch Systems. Using CICS/VS and IMS. Area. Birmingham. Salary c£6.6K. Ref. SA08

SAGE
SUPPORT ANALYST/PROGRAMMER required by established Software house specialising in Mini Computers. 2 years Basic + or similar language. Real pine applications, Area Nottinghamshire Salary to E6K, Ref. SA38.

SYSTEMS ANALYST required by International company in the electronics industry. 18 months plus experience on Main frame or Mini using Real time applications. Area Swindon, Salary c£5 BK. Ref. SA69.

SYSTEMS ANALYST required by Engineering Group, 18 months plus Systems experience, proferably with IBM Hindware. Area Rugby, Salary c£5K.

Systems ANALYST, at least 18 months in Systems or O & M Aroa Grantham Selary ct4 7K Ref SA99

SYSTEMS ANALYST, at least 2 years systems experience together with Cobol or a Mini language. Modern offices Canteen Flexi time, etc. Area Birmingham. Salary cc5.5K. Ref. SA128

Brmingham, Salary cE5.5K. Ref. SA1.28

SYSTEMS ANALYST, 2 years plus experience with a Cobol programming background Area Northamptonshire Salary to E6.5K. Ref. SA168.

SYSTEMS ANALYST has at loast 2 years' system experience including use of ON-LINE focilities Area. Halosowen Salary to NEG. Ref. SA196.

SYSTEMS ANALYST at loast 3 years in DP with formal COBOL background Area Soils Salary to 55.5k. Ref. SA195.

PROJECT LEADER to head now team specialising in real time production control systems, experience with minis. Area. Birmingham, Salary to 58.5k. Ref. SA194.

PROJECT LEADER at least 6 years in implementing systems software or

Ref SA 194
PROJECT LEADER at least 6 years in implementing systems software or packages with IBM Hardware new project work. Area Rugby Salary to 6250 Ref P156.
SENOR ANALYST/PROGRAMMER directly responsible to DPM at least 5 years in DP with sound working knowledge of RPG 11. Area. Nept Birmingham Salary to 56K. Ref. P377

Salary to Los Her P377

SENIOR SYSTEMS ADVISER for main frame manufacturer. At least 4 year commercial systems including knowledge of COBOL or RPG 11. Area Lecoster or Bristol. Salary, c58K, plus car allowatico and gonerous expenses. Ref.

PROJECT LEADER at least 5 years in DP including design of commercial ON-LINE systems for minis using BASIC + Area Statis Salary cf6 000 Rel

PS2.

BYSTEMS ANALYST at least 18 months oxponence in financial applications.

Area Birmingham Salary CC4 5k plus low interest mortgage. Buf. SA172.

BYSTEMS ANALYST around 3 years. DP P. expurience with LC L. burdware.

Area Covenity Salary. NEG. Ref. SA149.

SYSTEMS ANALYST RI least 4 years experion or in LC L 1900 and minis. Area Soniersol Solary to 55K Rol SA146
SYSTEMS ANALYST, 2 years plus experience any hardwore. Area Locester Salary to 55,500 Rol SA141
ANALYST, PROGRAMMER at least 18 mentiles experience on LC L 1900 under George 11 developing real time applications. Area Locester Selary c 15,500 Rol SA132

TECHNICAL SUPPORT ANALYST/PROGRAMMER at least 2 years using high level or basic language. Area. Birmingham. Salary c4 5,000 plus company car and expenses. Ref. SA137.

SENIOR PROGRAMMER/ ANALYST PROGRAMMERS

PROGRAMMER/ANALYST, 2 years plus Cobol with Production control or IMS experience. Area Staffs Salary c£4½K. Rof P125
PROGRAMMER/ANALYST, at loss 2 years' plus RPG II. Area Worcestershire. Salary to £5K Ref P342
SUPPORT PROGRAMMER required by Maintrame manufacturer, at least 18 months in RPG II or Assembler language. Area Nottinghamshire Salary to £5 5K plus expenses. Ref. P321
PROGRAMMERS required by West Midlands Software. House, At least 2 years' expenses. Ref. II. Cobol or Mini language. Salary range. £4K-£7K plus expenses. Ref. P367

expenses Rol P367
SENIOR COBOL PROGRAMMER, at least 3 years' experience using Roal time applications. Knowledge of Order stock system an advantage. Area tolestorshire, Salary to £6.5K Ref P362
PROGRAMMERS, at least 18 months' Cobol any Hardware. Area Coventry Salary c£4.5K. Ref P258
SENIOR PROGRAMMER, at least 4 years' programming in TOS and Assembler. Maintly financial projects. Area Gloucostershire. Salary, to £5K. Ref P368
PROGRAMMERS with P1.1 or Assembler in viscous Area. Button on Trail

PROGRAMMERS with PL/ 1 or Assembler experience Area Burton-on-Trail

SENIOR PROGRAMMER at least 2 years. COBOL preferably expension of on financial lodger, payroll or production control Area Loughburough Salary c558-Rol P245 TECHNICAL PROGRAMMER/ANALYST at least 12 months, programming in Fortunior similar language. Area. Birmingham or Rugby. Salary to 9.4 St. Ruf. P.287. PROGRAMMER/ANALYST at least 18 months, working with mines. Area Swindon Salary to C4 5F Ref. P379.

OPERATORS

OPERATOR, at Inast 1 year operating ICL 2903 or 1900 under George II. Area Northamptonshira Salary to \$4.250 Rel OP122
TECHNICAL SUPPORT ASSISTANT. Several years' experience in IBM 370 operations with sound knowledge JCL and also a knowledge of systems programming Area Stalits Salary 54.5K-561 according to experience. Rel O139

DATA 100 OPERATOR. Continual shift system, at loast 1 year a terminal expanence Opportunities for transfer to programming. Area. Nottingham Salary 13.5k. plus S.A. Ref. 0.140.

SENIOR COMPUTER OPERATOR. Double day shift. 1 year's plus expanence on IBM 370 using DOS. VS. Area. Birmingham Salary to 13.5k. Ref. 0.129.

COMPUTER OPERATOR. One year plus experience operating ICL. 1900 or Univac. Area. Coventry Salary to 13.7k. Ref. 0.131.

OPERATIONS TEAM LEADER. At least 3 years. ICL. 1900 experience with sound knowledge of George III. Area. Write. Salary 14.5k. Ref. 0.136.

OPERATOR, At least 2 years. Operating IBM 370 under OS. MVT. A chance to operate both IBM and Amdahi hardware. Area. Coventry. Salary. package to 14.350 plus paut over time. Ref. 0.0115.

We have many more 0 ${\mbox{\it P.}}$ positions on our register in all areas of the Midlands/West Country.

Contact: Graham Aston, M.E.C.I.

MARTINS COMPUTER SERVICES, First Floor, Western House, Opnosite Albairy Hotel. Smallbrook Queensway. Birmingham 85 4HQ telephone 021-643 2111 24-hour answering service. Evenings and week ands 021-454 0331

We are now able to interview until 6.30 p.m. and Saturday marning by



IBM

We are a major Company in the Pharmaceutical Industry with a modern factory at Morpeth in Northumberland where we produce and distribute a range of mainly ethical pharma-ceuticals for both home and export markets.

We have recently increased our on-site data processing capabilities by the installation of a large IBM SYSTEM 34 configuration which has created a vacancy for an RPG II Programmer. The planned development in-cludes inventory Control, Production Control, Material Requirements Planning Production Accounting, Purchase Order Management: and Sales Order Processing and Invoicing. Most of these require the use of real-time transaction processing techniques.

Candidates should ideally have at least a year's experience in RPG II on a machine within the System 3 family, but consideration will be given to those with a relevant background on other hardware or in other languages. They must also be willing to ept an early involvement in Systems

Salary will be negotiable according to experience and qualifications. Other employment conditions include 4 weeks annual holiday entitlement, Sickness Benefit, Contributory Pension Scheme and subsidised Staff

The factory is situated in pleasantly rural surroundings within easy reach of the uncrowded countryside and beaches of Northumberland, Assistance with rere-location expenses will be provided if

Please apply to: C.M. Whitney, Personnel Monager, Searle Laboratories, Whalton Road, Morpeth, Northumberland. Telephone: Morpeth 4311.

What you can get up to with Real Time Mini in Croydon

To £8,000 for Programmers with Intel 8085 experience

First thing you do after landing your plum job is belt off to Germany or Switzerland for a few months (so start rehearsing your yodel) to bone up on some of the world's leading communications systems secrets.

Meantime, if it's meant moving to somewhere nice near Croydon, your new house purchase can be "going through" ready for moving in when you get back — with the help of generous relocation expenses chipped in by our clients.

(Real Time Mini, see, thinks of everything.)

To £8,000 for Analyst/Programmers (Croydon)

Naturally, it will be nice if you have communications experience yourself. Certainly, a scientific, message switching, process control or flight simulation, type background is a big help.

A degree is essential, though we'll bend the rules if you have very

Languages: mini or micro Assembler (Real Time). Sex: suit yourself... Applications: Dial 01-836 9719 or 9882. Ask for Beryl McLaren.

> Computer Appointments (Real Time Mini's Place) Sulte 43, 12-13 Henrietta Street,

catascent

CONTRACTS FREELANCE **PROGRAMMERS**

register now for immediate and forthcoming requirements throughout

> LONDON U.K. EUROPE

If you have 3 years in D.P. If you want a top contract ou want a top rate

CALL

BOB EDWARDS

Datascene Recruitment Limit 01-439 1856 24 hour answer phone Sceptre House 169-173 Regent Street London WIR 7FB

HAZELTINE LTD.

HAZELTINE LTD.

SERVICE ENGINERS

Due to continued expansion we now urganity fitted to be our Birminghem/Bristol/Loridon sarvios great terminel range.

Saleries to £4500 are being offered shifted positions carry a company car.

Telephone now or write to: Bryan Aye Basiles (1988)

Hazeltins £1d., Terminal House,

Richmond, Surrey. Tel; 01-4483

Analysts-Come Aboard Now!

Sail away to the West Country and experience a new way of life, deep in the Cotswolds near Bath, Bristol and Gloucester. Design and implement new on-line systems including stock control, order entry, production costing and bought ledger. Utilise a forty ferminal network on-line to a 1 megabyte ICL 2960. Enjoy beautiful countryside, superb local inns, friendly colleagues and diverse leisure Apply your analysis skills to numerous application areas from a central site - one of five - in the heart of rural England. Our client a large, quality engineering company with a number of UK stensive overseas operations. Financial Relocation to £1,500 Gross Salary to £6,500 £8,000! Searhead an application area for a sea on-line system. Contact us for additional details, interview dates and a fad theet by phone or writing direct and discuss with us what this opportunity will mean for your and your Phine 01-388 4523 or 01-388 4865 and ask for Jeremy de Bage or Richard

JdB

Associates

Senior Computer **Operators** (3031/158)£4,500 plus

We are seeking Senior Operators for our large computer centre in the City which comprises a dual configuration 158 and a 3031, together with PDP machine. A three shift system is operated covering a five day week.

You must have O levels and at least two years' experience on large IBM 370 machines, which includes a full working knowledge of the VSI operating system and JCL. If you, are familiar with VM/CMS and dual configuration operating techniques, so much the better.

We offer an attractive salary, four weeks' holiday, non-contributory pension and ille assurance schemes and LVs.

Please contact Barbra Coulston on 01-588 2355 Ext. 683 to arrange an interview or write to her at the Personnel Department, The Stock Exchange, London EC2N 1HP.



The Stock Exchange

B.C.L. MOLECULAR 18 Mk. 2

Engineers merchants, situated in East Kent require software house-contract help for detailed design and implementation of on-line stock control system to interface with existing programmes.

Details of satistied clients on similar applications vital; Proposals in writing to Box No. 1999. The state of the s

Semior Customer Engineers

Versatec, part of the Xerox Group, supplies highly automated data processing equipment to industry for computer applications.

Continued success requires further expansion of our Engineering Department; we are, therefore, looking for senior engineers - preferably with DEC PDP.II experience — to complement our existing team.

The job, which involves both installation and maintenance of modern electrostatic graphic subsystems in the South West, South East and Scotland, is both challeriging and rewarding Applicants, male or female, should be self-motivated and capable of working from home or a local office with

the minimum of supervision. Salary and benefits are above average; an incentive scheme and BUPA membership are included. Contact David Goddard for more details.



Versatec, 27/35 London Road, Newbury, Berkshire. . Telephone: (0635) 42421.

REAL TIME *Systems Designers * Programmers *

PERMANENT of CONTRACT to work with our project team developing INDUSTRIAL and COMMERCIAL applications COBOL, CORAL, REG. PLAN; for clients in Lendon: Contact I, Gold, on 01-388,0036. 38 Warren Street, Londor W1P 5PD

IRISH SUGAR COMPANY LTD.

PROGRAMMER ANALYST/PROGRAMMER

The trish Sugar Company currently operates an ICL 1903A Computer at its Head Office in Dublin, with a communications-based network of Datapoint 1132 Terminals at each of its Branches, Further expansions are planned in the area of Distributed Processing using Minicomputer and Microprocessor Technology.

Positions Require

- Background of Good Programming Disciplines. ■ Minimum 3 years Cobol Programming or
- Knowledge of RPG II will be considered an advantage as will experience of communicationsbased systems and programming.

In addition the Analyst Programmer position requires:

- Active involvement in the design, documentation, testing and implementation of at least one major
- Knowledge of basic Systems Analysis and Design
- Proven capability to communicate effectively with

Successful candidates will share in the development of an integrated communications-based Management Information and Control System. They will also have an opportunity to participate in the development and use of microprocessor technology in a wide variety of

applications.

These positions offer excellent career prospects. Salary is negotiable and will reflect the high standards required for both positions. Other Benefits include a Non-Contributory

Applications in writing should be sent to the undersigned.

General Manager Personne St. Stephens Green House,

OPERATORS & **PROGRAMMERS**

IBM370/135 OPERATOR

£4000 An International banking organisation urganity needs DOS/VS POWER/VS Parks include cheep mortgage

One of Europe a teading companies need to identify a talented DR pictestional A background in COBOL and RPG II' useful, as is a knowledge of hardware postedions. Framework potential for each concludes.

ICL PROGRAMMERS

DOS-GRASP OPERATORS

assembler programmer

COBOL PROGRAMMERS £4500-6500

GEORGE II OPERATORS £4400

STAFFSCENE .24 hrs. DASSMARING REFORCE

COMPUTER RECRUITMENT 01-353 6931 9 ST. BRIDE ST., LONDON EC4

FREELANCE **ANALYST PROGRAMMER**

2903/4

Required for initially 3 months, probably extending to 12 months. Min. 4 yrs. COBOL, MTS/ETS essential. Location Central London: December

Send CV now to Heather Bowker, 35 Maryle: bone High Street, W.1. Telephone, 01-580 5577, ext. 3088.

Sales and field Service PDP11 Based Systems

To ensure continued expansion within the mini/micro computer markets, Plessey Peripheral Systems has a number of challenging opportunities for dynamic sales and service engineers to market or service a wide range of 'Add-on' equipment, micro computer packages and large PDP 11 based systems. Two of the appointments are at senior level. You should have a high degree of self motivation, initiative, and a proven track record in the



Skyline Hotel

(Nr Heathrow Airport) Bath Road, Harlington, Hayes, Middlesex on Wednesday, 22nd November between 10am and 9pm Ask for Miku Brisland, UK General Sales Manager or Mike King, UK Customer Service Manager

Highly competitive salaries are being offered together with a company car and participation in our incentive scheme. Normal large company benefits apply including membership of BUPA, contributory pension scheme and relocation expenses where

If you can't meet the managers at one of the hotels, contact them on Northampton (0604) 62175 or at home in the evening: - Mike Brisland on Brackley (0280) 702105 or Mike King on Lillingstone Dayrell (02806) 663.

Alternatively, please write, giving brief career details to John Lemar, Personnel Manager, Plessey Peripheral Systems, Water Lane, Towcester. Northants NN12 77N.



THE UNIVERSITY OF SHEFFIELD

DEPARTMENT OF APPLIED

opplications are invited from m and women for a post of

PROGRAMMER

from a date to be arranged. Splary in the range £3384 £4133 on the Grade 18 salary scale for Other Related Staff, which rises to £4882. Further particulars from the Requestrar and Secretary, the University Shelfield \$10.2TM to whom applicating the correspond to two referees about the safety of two referees about the County of the Research of the County of the

INFORMATICS GROWING

informatics inc

Directorate of Finance Computer and Audit Division:

Computer Auditor PO1(a) — £8,162-£8,777 p.s.

OPPORTUNITY FOR EXPERIENCED COMPUTER DESIGN ENGINEERS

An opportunity oxists to earn an earn substantial income. Experienced computer design engine ears are required who can offer the services on a part-time or finaliance bass in relian for substantial rewards. Jass in reliant to successful in the stricter if confidence in the first instance will win binel details The Managing Director CREEKMAIN LTD. 7 Rose Lane, Ripley, Surrey

PERSONNEL APPOINTMENTS PROGRAMMER/ANALYST

TROUBLE SHOOTING ASSIGNMENTS CIRCA £5,000

00 021-643-0951

SALES **EXECUTIVES**

Computer Services

New Scandinavian Investment In UK Timesharing Drive

CAPP ASSOCIATES Computing Services LONDON AND MANCHESTER

A leading Scandinavian DP services company is about to establish a substantial UK operation by the acquisition of a successful bureau, providing timesharing and remote batch services. Initial market penetration will be concentrated on the South East, creating exceptional opportunities for Sales Executives; a London based team of two is about to be established to substantially increase sales of timesharing services, based upon IBM hardware.

The parent company is successful in Northern Europe and is part of a major group with operations in stainless steel, oil, industrial equipment, building, shipping and international trading. The DP expansion is part of a plan to establish an international network in Europe and the USA.

London Based £12,000 minimum

(on quota)

The company has assigned CAPP ASSOCIATES to recruit for the posts and a Director is available to discuss the opportunity with Sales Executives who have achieved considerable success in a field to data processing; preferable bureau or support services. A realistic remuneration will be negotiated, with a significant guarantee and the benefits normally associated with positions at this level. There is realistic potential for personal elopment into more responsible roles in the sales/marketing functions. Please telephone immediately to discuss more fully and arrange a convenient meeting if required. Quote ref: CW 46-8B.

> 01-686 9693 (24 HOUR ANSAPHONE) 19, PARK STREET, CROYDON, CR9 ITN

Unrivalled career development opportunities. Opportunity to travel-Europe, USA. Highly competitive salaries.

Programmers/ Systems Programmers

Bonus scheme.

Central London £4.5k-£9k

Altergo Software Limited is the leading supplier of European systems software products throughout the world. Our product line includes the SHADOW II teleprocessing monitor and QUOTA II, the on-line program development system for IBM 360/370 installations. Altergo's product sales are increasing at over 100% worldwide each year. A number of opportunities therefore exist for programmers and systems programmers to join our London based Support, Development and Applications teams.

Systems Programmers-£6·5-£9k

A good working knowledge of DOS or OS and Assembler is required. TP experience and knowledge of COBOL or PL/1 will be an advantage. Successful applicants will have the choice of working either in software development or on customer support or both.

Senior Applications Programmers-£5.5k-£8k Application Programmers-£4-5k-£7k

A strong Assembler background is necessary for these positions. COBOL and TP application programming experience will be a definite advantage. Re-training in SHADOW II programming techniques will be provided. Successful applicants will work with SHADOW II users in the development ns or in conversion projects from CICS to SHADOW systems. and also in-house applications development projects.

All employees have the opportunity of travelling to Europe and the United States, Salaries are strictly related to ability and performance. All employees share in the company's generous bonus schem

Altergo provides a very satisfying and stimulating working environment for people who wish to work exclusively in the development environment and those who prefer the day to day interface with users, both in the U.K.

To discuss how we can help you to make the most of your career, please lotephone Pat Baker to arrange an interview or write to: Pat Baker, Allergo Software Limited, Imperial House, Kingsway, London WC2B 6UN.



Systems Programmer

3031 at the Filton site, we have a vacancy for an experienced Systems Programmer to assist in the conversion from SVS to MVS in the coming

We would like to hear from you if you have at least 2 years' SVS or MVS experience in some or all of

Systems Generation System Maintenance (SMP) HASP/JES2 TSD

Assembler TCAM/VTAM

Programme Product Implementation

We provide an extensive TSO network, centred in Bristol, for the whole of the Weybridge/Bristol Division in addition to links with the Weybridge

Conditions of employment include a list-class contributory pension scheme, free sick pay and life assurance, and excellent welfare, social and sports

Plaase telephone or write for an application

Employment Manager (Ref: AIR/37) British Aerospace Aircraft Group, Filton House. Bristol BS997AR Tel; Bristol 693831 Ext. 140

BRITISH AEROSPACE

PROGRAMMERS c£5500 **PROGRAMMERS** c£4500

ANALYST/

Scholl (U.K.) Ltd. are currently developing advanced on line systems for their Production and Shoe Marketing divisions. A new UNIVAC 90/40 utilising TOTAL Database and on line program development is to be shortly installed.

Additional staff are now required to develop these systems through to implementation. Applicants must have a minimum of two years COBOL. and experience of data base and/or real time program development would be of distinct advan-

Genuine opportunities for advancement into Systems Analysis will exist for successful candidates who can prove their worth to the installa-

For an early interview ring

ALAN ELLUM on 01-253 2030 or write to him at

SCHOLL (U.K.) LTD. 182/204 ST. JOHN STREET LONDON EC1P 1DH

ASSISTANT AUDIT MANAGER

Cheshire

up to £8157

The Data Processing Section of our Audit Department require an Assistant Audit Manager to be based at our Headquarters in Altrincham,

Our installation currently comprises two ICL 4/70s which are scheduled for replacement by ICL 2972 and this conversion is being monitored by DP Audit.

Reporting to the Regional Audit Manager, the successful applicant will supervise a small team during completion of a Computer Audit Plan; and the position demands a high level of technical expertise relating to Programs, Operations and Data Control. The ability to communicate the state of t effectively at all levels of management both verbally and in writing is essential.

Salary within the range £6882-£8157.

Please telephone for an application form and return it quoting reference B218/A/CW, not later than 24th November, 1978, to: Director of Personnel, North West Gas, Welman House, Golf Road Altrincham, Cheshire WA16 8AE Telephone: 061-928 6311 ext 493

NORTH WEST GAS

16 YEARS ON... informatics inc



Computer Data Processing Limited

Experienced **Computer Operators** and Control Clerks

tion of an ICL 2960 early next year.— we require experienced operators and control clerks to join our efficient and herd-working Operations Team.

The present configuration consists of two large ICL System 4/72's, 28 EDS60's, 14 MTU's 4 LP's, 2CR, 30 local VDUs and 4 RJE's.

Ideally, applicants should have two years' operating or control experience on System 4 or IBM 360/370

Experience on 2900 - either operating or SCL would also be an advantage...

Three-shift working (Monday-Friday) is in operation. Our office is located very close to the main-line station (London 43 minutes and Brighton 15 minutes).

Applications to: Alan Merrion Operations Manager COMPUTER DATA PROCESSING LTD. Perrymount Road Haywards Heath, Sussex Haywards Heath 59188

ipc

digico SOFTWARE **PROGRAMMERS**

We are the leading and fastest rowing minicomputer manufacturer in the U.K., and we are looking for young people to enhance our range of system software. Specifically, this s an opportunity to take part in the development of operating systems, compilers, loaders and the whole range of program production tools.

£4000-£5000 Herts A

To succeed in these jobs you must already have experience of writing in Assembler on some minicomputers, and you will probably have a degree or adulyalent qualification. You may not have direct experience of writing systems software, though it helps if you do, but most important is the letermination to expand your experience and succeed in this challenging technical area.

Telephone Maxine Anthony 0438-4381 for an application for

DIGICO LTD.

Stevenage, Herts SG1 4PY Tel: (0438) 4381

CONTRACT PROGRAMMERS

urgently required with the following experience:

IBM 370 RPG II Burroughs 6700 COBOL IBM MTCS

Top rates - weekly paid

Focus Computer Services (Emp. Agy.) 28a Devonshira Street, London, W.1. Tel: 01-487 5781

16 Bedford Row London WC1R 4EB 01-242 9356 Telex 21120



Specialists since 1971 in UK and international computer appointments

occ computer personnel limited

Hampshire

Senior Programmers

to £7,000

New data centre. Mainframes and minis

These vacancies offer you the chance to extend your skills and experience, since the data centre is comprehensively equipped with a number of mainframes supporting on-line systems, and mini computers which are either free standing or linked to the

Senior programmers are encouraged to broaden their range of experience either by becoming more involved with users of the systems or in more senior technical positions. With three operating systems and three languages in use, together with interactive program development facilities, and state-of-the-art applications, the acope for career development is unequalled. You need to be a very competent programmer with experience of COBOL, BASIC or DIBOL and an eagerness to learn new techniques. Ref: 258/CW/Neville John.

London to £6,000

Fortran Programmers

Our Client is a small expanding software house specialising in the development of a management control package that is being designed to run on various types of hardware. At the moment the work is based in London, but when the package is ready for marketing there will be a chance for overseas travel. Other areas of specialisation include transportation planning and engineering analysis especially in the civil and structural fields. They require

- 1 Programmer to £5,000
- 1 Analyst/Programmer to £6.000
- 1 Programmer to £6.000.

One of the programmer positions requires two years' transports tion experience. All positions require two or more years experience of FORTRAN. Further details can be obtained from Sarah Hurn. Ref: 494/SH.

Cambridgeshire

£3,400-£9,500

Ref: 158/CVV/Fran Setter.

A specialist department dealing with the application of computers to design and manufacture is expanding and needs personnel at all levels. Programmers with FORTRAN experience and a degree in engineering, maths, computer science or chemical engineering are welcome. There is also a vacancy for a maths or computer science graduate with database design experience to sell the existing database software and act as a consultant systems designer. At a more senior level Project Managers and Consultants are needed with specific experience of the following

industries; chemical, manufacturing, process and consumer. This is an opportunity to utilise your creative talent and specialist knowledge working with multi-disciplinary teams to develop

City

Analyst/Programmers

to c £7,500

Our client, a subsidiery of a major morchant bank, wishes to recruit analyst/programmers with a good knowledge of COBOL or another high level language, to be responsible for their own part of a project from start to finish, including user-liaison at all stages. They have a large mainframe and a varied communica-

In addition to good starting salaries, the company offers, after a qualifying period, generous mortgage subsidy, non contributory pension and free BUPA. Free Life Assurance of four times the annual salary and L.V.'s are available on joining. Ref: 750/CW/Joan Ainsworth

To apply for any of the above positions or for further information, please telephone the Consultant concerned during working hours on 01-242 9366 or write to the above

if it would be more convenient to telephone in the evening, or at weekends, the

telephone numbers are: Fran Setter — 01-874 6372. Sarah Hum 01-673 0205. Neville John — 66 52880

Computing Services Association

Contract Programmers / Analysts

If you are thinking of doing contract work why not start here by registering now for immediate and

forthcoming requirements. For further details contact:

Bridget Kotchie RENDECK LTD. 100 New Bond St.

London W1. Tel: 01-629 5438



INTERNATIONAL **VACANCIES**

COMPUTER

Increased demand for our products overseas has led to vacable had Distributors' organisations, mainly in the Middle East, These Distributors' organisations, mainly in the Middle East, Th Analysts.

Suitable applicants should telephone (reversing charges) Hemel Hempstead 61266 and ask for Mick auton. or you can write to him at the following address:



HIIF Computer Machinery Company
Maxied Close, Hemet Hampstead, Hertfordshire Hampstead, Hertford

Consultancy/ Software House Wimbledon up to £9K plus

Our client, the Cross Computer Group Ltd, is a long established, growing Consultancy and Software house, providing services to a number of Reinstrance Companies. Insurance Companies. Commercial and Government Organisations both in this country and overseas. The work is largely turbouse', based at our offices very close to Wimbledon main line and underground. ration, but occasional visits to client sites may be require

Theome still small enough to offer a triendly personal but desirand working environment and dedicated to providing the lessional working environment i i possible service to their chents

The Group has its own in house Computer Sestem, offering interactive development lacilities, through VDD screens, in a virtual storage environment, on modern sophisticated equipment There are a wirle variety of permanent positions available and salaties reflect the importance placed upon the need to employ conscientious people with ability and responsibility

Salaties start from around £3,500 per aroum for junior staff to an eatrong potential in excess of £9,000.

Technical Consultants

The requirement here is for experienced senior analysis with personality and alilly to communicate. They will take on a customer flasson role, perhaps even a little marketing, but have the technical ability to follow projects through to completion in a project management capacity. It is likely that such people will be older than 27 years, with a degree, or equivalent, and some 8 years + experience in data processing.

The Group is developing a major on time package for the reinsurance industry and need good analysts (at various levels) with on the and financial systems expenence. General commercial analysts are also required for work in other areas.

Analyst/Programmers and Programmers

The abovementanced on line package is written in COBOL (ANS). We require several Programmers for this and other projects a minimum of 2 years COBOL and for RPGII would be required.

Contract Staff

The following represent a solection of our current assignments in the atomy from Berliondslare to Bernauda. . PDC 11 FORTRAN Real ton

Real-time On Line scientific. Medical application

Univac 1100 COBOL to COBOL conversion. hase exp. preferred

Frankfur

PL 1 CICS immediate start > TOP RATES RPG If on System 3 UCP programmer, analysis required for January start Real time programmers required immediately CORAL 66 and or Assembler

•Series VPL L'Assembler New Year •370 COBOL = TP or TASKMASTER preferred 2 people who speak French required for 2 years (Immediate start) *Datapoint 5500 (Databas) end November Competent COBOL programmer — knowledge of Sestem 3 essential Levels to work in London to code and study job

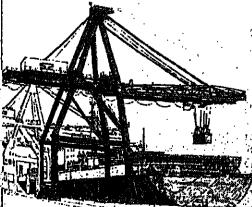
December in Bermuda to implement the Garly complex system for re-insurance Chear

Serior analysis, programmers, IBM environment



Meteor Computer Consultants Ltd.

Systems Manager oalary: Up to £7,364 including London Allowance



The British Transport Ducks Board Computer Centre at Southall, Middlesex which provides computer services for 19 ports and other Port Industry organisations, requires a Systems Manager responsible for advising the Board's management on the use of computers and for managing all aspects of the development work undertuken benefits of the development work undertuken benefits of the development work undertuken. by a team of up to eight systems and programming staff working on a variety of projects. Applicants, factor women should ideally possess a degree or relevant professional qualification and have several years' project intamgement experience of commercial applications. Applicants are invited to contact 'I'm Beyer, Deputy Head of Computer Services on the 373 50 15 or write to 'I he British Transport. Docks Board, Computer Centre, Hayes Rond, Southall

British Transport
Docks Board

Systems Analysts: Trainee Systems Analyst

Our management services department at our Group Headquarters in York has openings for:

SYSTEMS ANALYSTS . . . with between one and three years' experience. to work on a wide range of new systems developments

Distribution, Sales, Production, Purchasing, Export and Engineering are just a few of the areas in which we are currently developing systems. Your particular experience need not be in any of these, as we will provide training according to individual needs. We are looking for the investigative, personal and technical skills necessary to carry a project through from an embryonic idea to a functional system. If this can be backed up by imagination, self reliance and an inclination to tackle demanding and challenging problems,

The equipment we are currently using includes the IBM 370/148 and IBM 370/158 computers with off-line and on-line terminals. Our main programming language is PL1 and our operating system is VS1 with VM/CMS in use for the interactive development of programs. During the first half of 1979, an IBM 3032 will replace the 148 and MVS will replace VS1.

TRAINEE SYSTEMS ANALYST . . . to work within a systems development team. We are also interested in applicants who have recently graduated; or those with at least two years' programming or systems re-

Starting salaries will be competitive and will reflect current market rates. In addition, there are good prospects for promotion within management services and into other areas of the company.

If you are interested in either of these posts, please write for an application form, quoting ref. FY/604, to Miss D.M.N. Dick, Staff Office, Rowntree Mackintosh Ltd., York YO1 1XY.



Rowntree Mackintosh 💑



IBM 370 & PDP-11°

Analysts - Designers -**Programmers**

£6,000 — 10,000 p.a. London + EEC

INFORMATICS INC. can offer genuine ground-floor appointments to Programmers, Analysts and Designers who have specific experience of any of the following:COBOL,PL/T,Assembler,MKTV,CORAL 66 basic, RTL II on IBM, PDP-L1 or other mini systems. If you have either potential or proven experience in IMS or CICS on IBM 370 under O.S. or Message Switching and other real-time communications expertise on Minis we would like to meet you. At Informatics you will certainly be encouraged to develop creative skills and to contribute your ideas within an innovative environment coupled with significant autonomy. You will also be called upon to shoulder more responsibility than you have in the past. You will also be given every opportunity to extend your skills and horizons. through our enlightened policy of training and orient-

To those who enjoy travel we ofter positions in Holland -U.S. offices for 18 months

We believe we are currently paying amongst the highest salaries in the industry and will of course also. imeet all your re-location expenses. All positions are prestige international consulting company.

interview in London.

informatics inc

Africa House 64-78 Kingsway London WC2B 6AL 01-405-8546



HERTS

NORTH LONDON

COMPUTER WEEKLY, November 16, 1978

THE SALES BIT

The value of sales literature

ASSUMING that the sales-material can relate man knows how to use his specifically to a particular sales literature effectively, product, industry or busiand that he was able to ex- ness activity it is bound to nound his ideas at the time have greater conviction in he material was designed, the eyes of the client than there is very little he can do | amorphous | "catch-all" brochure and leaflets that Sample outputs/reports

reference clients, relevant that.

pplications and so on.

We have recently installed an ICL 2960 and on ICL 2094 to provide a computing service to the whole Polytichnic Appliliterature is to confirm a lise a selling point. cations programming projects cover not only scientific and technical work but also the dusign and implementation of computer systems for the administration and library. The Computing Centre sieds to recruit a programmer of graduate or equivalent qualifications, and some previous experience, who wishes to intrinse his her experience by working an modulin computers. There is a wide range of projects new being started including graphics software, implementation of the IDMS sequence in which it is per-

There may sometimes be

reasons why it is necessary

Bearing in mind this close relationship between literature and the sales presentature and the sales presentature. Supplier's corporate tower in down-town Chicago.

The copy itself needs to

security for the buyer. If Solicit the opinion of people sales literature does not within the sales and margive an impression of keting departments on your reliability and professional final draft rather than at the ism the buyer will feel less embryonic stage.

secure and therefore less

COMPUTER DEPARTMENT

BICC GENERAL CABLES L!MITED LEIGH WORKS Applications are invited for the following positions:

SYSTEMS ANALYST applicants should have a sound knowledge of commercial

routines, e.g. stock control order processing, etc. and have a background of O. & M or similar discipline. A knowledge of

The successful candidate, male or female, would be

xpected to take responsibility for an area of compute

application, e.g. accounting, commercial, production, etc. and will be required to develop now and existing systems as

equired. The job will involve some travelling to various sites broughout the Company and a current driving liconce

SENIOR PROGRAMMER

Applicants, male or female, should have at least two years' experience of ICL COBOL, a full working knowledge of the

GEORGE III operating system, and experience of super-vising a team of programmers

The principal duties will consist of designing program

ites from system specifications and being responsible fo

BICC is one of the UK's major companies and an

attractive commencing salary and conditions of employ-ment will be offered to the successful candidates.

Applications in writing giving details of age, qualifica-tions, experience and present salary should be sent to:

Mr. P. Jackson Personnel Officer (Staff) BICC General Cables Limited : West Bridgewater Street LEIGH

Portsmouth Polytechnic

Applications

Programmer

Senior Computer

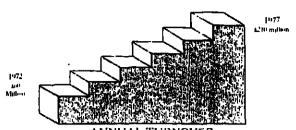
Operator

Computing Centre

mplementation and subsequent program mair

BICC

rogramming would also be advantageous



NIX DORF COMPUTER has been involved in electronic data processing since the early days of accounting machines and visual record computers. This initial experience has given us a greater understanding of management needs than most other suppliers when it comes to producing computers for the effective control of all aspects of modern hisiness. 60,000 NIX DORF installations says that has to be a fact.

comprehensive portfolio of program packages covering such applications as:-

ons coming equipment, computer bureau services, or peripheral equipment, related to

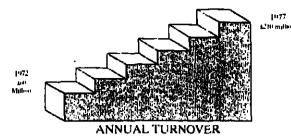
bud this a good opportunity to move into the booming market of computers.

An initial guarantee against commission earnings is negotiable. Joh opportunities are available in:- London Branches, Birmingham and Manchester, Please apply to Owen Cooper, Nixdorf Computer Ltd., Hounslow Centre. Hampton Road, Hourislow, Middlesex, TW3 IJB. Telephone: 01-572 3111.

c. £6,600

o. £5,000

Sales Executives



We produce superbly reliable computer bardware. If you look inside any of our computers you will be immediately impressed by the Teutonic Efficiency of it's design and construction. IF THE 8870 DISK BASED SYSTEM IS THE MERCEDES OF BUSINESS COMPUTERS

We believe in providing our clients with total computer systems rather than supplying the hardware and passing the 'software buck' elsewhere. For this reason we have our own

PRODUCTION CONTROL: Inventory Management and Purchase Control, Bill of Marcrials Processing, Materials Requirements Planning, Production Scheduling and Costing. COMMERCIAL ACCOUNTING: Invoicing, Sales, Purchase and Nominal Ledgers, Credit Control, VAT Accounting, Payroll.

East growing demand for our new 'state-of-the-art' disk-based business computers has

Senior Sales Executives

With at least 2 years' successful sales experience of small business comparers, data

Sales Executives

With a record of soccess in selling office products, clerical systems or business forms will Our saley operation is backed by a high level of technical support and comprehensive sides and product training is provided. A generous income package is available including a high base salary, commission and large company benefits. Our successful sides executive, typically

£13,000 per annum

GROW! NIXDORF COMPUTER

TEXT PROCESSING

PDP 11/34

Senior Analyst/Programmer c. £5,800

ngman Group, leading educational publishers are embarking on

an exciting range of projects in the Dictionary and Reference Book

area and require a Project Leader, a Senior Analyst/Programmer

and two Analyst/Programmers to help develop the associated

A programming background is essential for these positions and

previous experience of text handling systems and/or basic plus and

RSTS/E are desirable. Experience of Information retrieval would be

a lurther advantage. Emphasis will be placed on individual

responsibility working within a team environment and on close user

The positions will be based at the company's head office in Harlow, on

the Herts/Essex border. Working conditions are excellent and a wide

range of company benefits is available, including generous

For further information please telephone Stella Etherington on

Harlow (0279) 26721, extension 29 or write to her at:

Project Leader

computer systems.

Longman Group Limited,

Analyst/Programmer

DATABASE

BENIOR DATABASE ADMINISTRATORS & DESIGNERS— LONDON & EUROPE The U.K. and European divisions of a U.S. public Corporation have openings in their London & Zurich offices for Sanior Database Administratory. Designers and Applications personnel with extensive Database orporience using any of the manufacture Database orporience using any of the manufacture Database. tions personnel with extensive patchess arperience using any of the proprietary DBMS currently it use on major main-frame and mire systems. Of particular interest are passons with expertise in IMS TOTAL, ADABAS, DMS, IDMS, and TOTAL, ADABAS, DMS, IDMS etc. Hardware backgrounds are of little importance — what is essential to the depth of experience in your relevant ares of Database experise. Our client is anxious to mointein it's presiglous standing world-wide by attracting proven and potential talent to Join them in the development of subargood Database.

rado (Solarios: CS-16,000 p.e. Irado (1 Salarios: C7-10,000 p.e.



OXFORD UNIVERSITY

SHIFT LEADER

The Service provides computing iscillities for the University based upon 2980 and 1908A central processors, with communications front-ended by 7808, 7803 and Mod 1 computers. Graphical out-out and microfiche are also pro-rided. The Shift Leader Is resconsible for running one main rame and its associated equip

andidates for the post should nave at least two years' ex-perience of GEORGE 3, or at least two year's experience of VME/B Salary scale £3,060-£4,104 per endum plus shift allowance 5647 (3 shift) or £486 (2 shift)

Application forms and further latells may be obtained from

Ales J. C. Luste Executive Computing

installation of package software within commercial or industrial accounting Junior Support Analysts of Some opportunities are open to applicants with formal accountantly qualified the

irmingham and Manchester.

Please apply to Owen Cooper, Nixdorf Computer Ltd., Hounslow Control
Lampton Road, Hounslow, Middlesex, TW3 1JB. Telephone, 01-573 311



Senior & Junior Systems Analysts

Come and join our team at I eavesden where

we are currently operating an IBM 370/135

installation but shall be appraiding within the next few weeks to an IBM 370-138 (1 Mb)

operating under DOS/VS with POWER/VS

IBM-DOS experience you could be just the

person we are looking for. Contact us today!

We will offer you an attractive commencing

salary plus all the usual benefits of working

for a major Company. There is also the

For further information or an application form please contact PETER BANTON, SENIOR RECRUITMENT OFFICER,

ROLLS-ROYCE LIMITED—

GARSTON 70935.

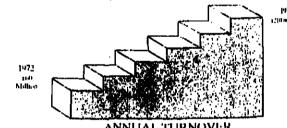
AERO DIVISION

AERO DIVISION, LEAVESDEN,

WATFORD, WD2 7BZ, or telephone

superb Rolls-Royce Sports and Social Club,

and CICS/VS. If you have one year's



NIXIORF COMPUTER has been involved in electronic data processing since the early days of accounting machines and visual record computers. This initial experience has given us a greater understanding of management needs than most other suppliers when it comes to producing computers for the effective control of all aspects of modest business. 60,000 NEXEX installations says that has to be a fact.

We produce superbly reliable computer hardware. If you look inside any of our computer you will be immediately impressed by the Tentonic Efficiency of it's design and constructed. IF THE 8870 DISK BASED SYSTEM IS THE MERCEDES OF BUSINESS COMPUTES. THE 8820 IS THE BMW!

We believe in providing our clients with total computer systems rather than supplied hardware and passing the 'software buck' elsewhere. For this reason we have our own comprehensive portfolio of program packages covering such applications as:-PRODUCTION CONTROL: Inventory Management and Purchase Control, Billof Management, Materials Requirements Planning, Production Scheduling and Costing. COMMERCIAL ACCOUNTING: Invoicing, Sales, Purchase and Nominal Ledgers, Crest Control, VAT Accounting, Payroll.

Fast growing demand for our new 'state-of-the-art' disk-based business computers'

Sales Support Analysts

To work closely with sales people in the preparation and presentation of proposition are the production and design of packing the production and presentation of proposition and presentation of packing the production and design of packing the production and the packing the production and the production and the packing the packin

Applicants should have a minimum of 2 years' programming experience processing COBOL or BASIC, concerned with at least three of the above application areas.

Senior Support Analysts

Should have at least 2 years' additional analytical experience or involvement in the

experience of interactive programming.

These job opportunities will provide an income range of £6,000-£8,000 pt generous car allowance and large company benefits. Locations — West and Central Research Company benefits.



Longman Casex, CM20 2JE

about the efficiency of the brochures.

Let us view the situation long as they are basic docufrom the point of those re- ments rather than attempts sponsible for creating sales to show how clever the literature. In a small com-supplier is. A relevant pany where sales and marketing responsibility probably resides within a single department, the job is likely to be the responsibility of the sales manager (or a rose the sales manager (or a rose the sales manager (or a rose).

by any other name!). In a tem operates. larger organisation it is A "benefits list" is an esrightly the lot of the mar- sential feature of any sales The control of such are not only the reasons activity is certainly not the why the client is going to function of an internal or buy, but also confirmation external artwork or adver- of the platform from which tising resource. Their res- the salesman will attempt to nonsibility should be limited close the sale. to aesthetics and possibly Some salesmen like to

writing copy in the context-tick or underline the most of presentation, not making relevant benefits just before fundamental decisions on handing over a leaflet or markets, benefits, pricing, brochure; I don't object to

So what are the considerrelevant.

database, and software, to support minicomputers linked to the Salary Scale: AP2/4 up to a maximum of £4,632 including

tation to fit new literature, but whichever way modifi-cations are made the sales manager must be involved

The Polytechnic service is based on a large ICL 2960 supplemented by ICL 2904 and a professional operator is required to mented by ICL 2004 and a professional operator is required to join a small operations group currently working on two shifts. Candidates must have a good understanding of VME/B or an equivalent operating system, and at least three years operating experience together with an 'A' level standard of education. Selary up to a maximum of £5, 149 including shift allowance, overtime and supplement.

Applications are available from the Staff Office, Porta-mouth Polytechnic, Alexandra House, Museum Road, Portamouth, or by telephoning Portamouth 27681 exten-

Weish Health Technical Services Organisation Systems Analyst £4,421 - £5,326 p.a. (Scale 4)

Applications are invited from suitable applicants for the post of Systems Analyst in the Organisation's Computer Department. The successful applicant will be required to assist in the detailed design of a computer based information system. A previous knowledge of Systems Analysis

would be an advantage. Application form and job description obtainable from the

Personnel Department, Weish Health Technical Services Organisation, Heron House, 35/43 Newport Road, Cardiff. CLOSING DATE: 29th November 1978.....

COMPUTER DEPARTMENT Weish Health Technical Services Organisation Swyddfa Gwasanaethau Technegol isohyd Cymru

concerned.
Specialisation is so much more powerful than generalisation in all aspects of sales and marketing and this is particularly true of THE largest product results sales literature if such from 9.447 times 37.53).

are made available for his are always good value in sales literature, but only as

literature. After all, these

It is difficult to say very much about what is good or ations the marketing de- bad in the context of artpartment needs to make?' work. The whole topic is Certainly there are many, highly subjective. However, and I can only hope to touch one thing is certain: the on those which I feel are function of artwork within sales literature is to comp-If we accept that the lement and enhance and primary function of sales wherever possible emphas

sales story which has It seems to me this is already been told, then it is where most of the really essential that its continuity—disastrous errors of judgis compatible with both the ment occur — the use of too sales argument being pre- many colours, self-sented in the field and the indulgent design, bizarre photography, and so on, typically geared to the eccentricity of the artist

business management.

tion, one must consider the be absolutely succinct and basic structure of the sales positive getting quickly to salesman. Too many sales "reference sells" where possible) by describing the product and its range of neath a plethors of verbiage

Puzzle Answer

rather than the needs of One particular point about photographs: they must be relevant. Pictures of buildings and lorries, for

from the outset; and for a instance, are of interest only variety of other reasons too. to the building and trans-Another point about con-tinuity is the fluency of the duct being sold is, say, stock dialogue and the overall control for the pharlay-out of the design. It maceutical industry then let must be easy to read as well us see the main warehouse as providing a reason for of the Beechams Group for reading on to the very end. instance, rather than the

call, Seek the client's pro-blem, identify the solution and agree reasons for products offered by the Sales literature should documents wax eloquently enhance the professional almost lyrically, about a wide range of topics from credibility of the supplier by wide range of topics from promoting the industries the state of the economy to and applications where ex- the supplier's sports and perience and success is social club without making aiready established (using the point. Even if the major

product and its range of neath a plethors of verbiags uses, and highlighting the benefits and unique advantages the company and protages the compa



Computer Operators We specialise in D.P. recruitment in the Herts/N. London area and the following vacancies are a selection from our current register. Analyst/Prog. Cobol c. £5500

WATFORD Sen. COBOL progs. any machine, c£ 6000 **EDGWARE** Anal/Prog. to £5500

WEMBLEY PL/I Progs., to £6500

WALTHAM CROSS

ENFIELD

COBOL progs, any machine, to £5500

ST. ALBANS

or graduate Trainee, £3300 WELWYN S.A. IBM background, to £7000 COBOL progs, to £5400

Syst/Prog, to £6000

S.A. 2 years exp. to £5900

IBM COBOL Progs to £5800

PL/1 Team Leader to £7000

Anal/Prog, £5800

POTTERS BAR

Prog or Prog/Anal, any machine to £5500 TOTTENHAM IBM 370 Operator £4200+

Sen. R.P.G.II Prog, to £5700 HODDESDON S.S.A. 3 years exp. to £6500

STANMORE S.A. £6500+ BOREHAM WOOD IBM Cobol or Ass Prog. 1 year +. To £4500

CHESHUNT

ENFIELD

vould like to talk to vou

and continues to expand.

For more information ring:

Tel: Cuffley (Herts) 4130

HAYMARKET COMPUTING LTD 学习企业的主义的重要性的重要人类的重要的主义的发展的自己的主义的主义

IBM·S.A. to £6500

PL/1 Progs to £6300

So you think you know RPG II

If you know it well enough to find faults in the system software, then we

The person we need should have: About 3 years experience in RPG II programming A knowledge of the RPG compiler and run time controller

Some assembler language experience Ideally experience of sort and merge programme usage * An engineering mind capable of writing and enhancing test software with minimal supervision.

Data 100 are the world's leading supplier of computer terminal equipment

For further details contact Geoff Hicks, Data 100 Ltd., Maxied Close.

* The chance to enter the expanding science of software testing Excellent career development prospects . · Stimulating environment & Good company.

Hemel Hempstood, Horts HP2 7EG. Telephone: Homel Hompstood 61281. **DATA 100**





Communicate with Racal

Enquiry Systems Limited is the newest Company within the international Racal Electronics Group The Company develops and markets message communications and televiruan agentical systems using microprocessor technology. Opportunities now exist in the following areas:

Design and Development Engineers

- to be involved from conception to production in the design of special products in the message switching field

Applicants should hold Degree. HNC qualifications and have experience in digital electronics. microprocessor firmware or communications

Opportunities in Hardware and Software

 to join a small but highly-motivated team developing software for a microprocessor based. communications controller

Applicants should have five years experience in one or more of the following treat time system. programming, basic software development, system design, hardware, software interfacing

Applications Programmer

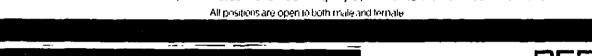
- to be actively involved with the software development team with the opportunity to move into

Applicants should be experienced assembler programmers who have been involved in the successful implementation of at least one major system. The ability to program in real time at a

All positions carry attractive salaries and benefits and will be based in High Wycombe. Bucks: Relocation assistance will be available where appropriate

Write with details of age, qualifications and experience to

Personnel Officer Enquiry Systems Ltd. Halifax House. Coronation Road. High Wycombe. Bucks.



DO YOU WANT YOUR CAREER TO TAKE OFF WITH A COMPANY THAT IS GOING PLACES?

DELTA DATA SYSTEMS LIMITED have been installing sophisticated video display terminal systems for many years.

To compliment our existing range of programmable terminals we are introducing a new series of super-intelligent video display units. They are probably the most versatile products of their kind currently available

Our policy is to provide one hundred per cent support to our ever increasing user base, and to do this we need to employ more high calibre people who want their careers to grow quickly with an expanding company.

CUSTOMER SERVICE ENGINEERS

We need highly motivated Customer Service Engineers with significant experience on state of the art products, preferably advanced microprocessor based equipment. Since you will be working largely on your own initiative, it is important that you REALLY CARE about the standard of service you give to our demanding users. An excellent remuneration package includes a new estate car.

TECHNICAL SUPPORT PROGRAMMERS

Ideally, you should have a good academic background and at least two years of experience in programming micro or mini computer systems at assembly language level. You will be joining a young and enthusiastic team and will be working in close liaison with colleagues and customers. It is therefore essential that you are imaginative and flexible in outlook and have good verbal and written communications skills. We expect you to progress quickly and to assume project management responsibilities in the near future.

Your initial remuneration will depend upon experience and the excellent package we are

All appointments are based at our European Headquarters in Welwyn Garden City and there may occasionally be opportunities for short duration visits overseas. Interested?

Write to, or call, George Isaacs DELTA DATA SYSTEMS LIMITED



Delta Data Systems Ltd

wallowfields Welwyn Garden City Herts AL7 1JD Telephone: W.G. 33833

PERKIN-ELMER DATA SYSTEMS

Compiler Development

Salaries up to £7500

PERKIN-ELMER DATA SYSTEMS has further vacancies for programmers to work in Compiler Development in our Basic Software Department. We are looking for staff with a good background in Assembler-Level programming, and some Compiler experience in Development or Technical Support role. A working knowledge of one or more high-level languages is required, and we will be particularly interested in COBOL expertise.

We are located between Slough and Burnham in Berkshire, with excellent motorway and rail links to London and the West Country. We provide all the usual large company benefits, including relocation expenses where appropriate, pension and health insur-

For further details, telephone or write to Lon Barlow at: PERKIN-ELMER DATA SYSTEMS 227 BATH ROAD SLOUGH, BERKS. TEL: SLOUGH 34511 ext 95

COBOL **SYSTEMS ANALYSTS PROGRAMMER**

Sterling Cable Company Limited, part of an international group, are one of Europe's foremost designers and manufacturers of industrial electrical cables. Our works and offices are located in rural surroundings on the A4, nine miles from Reading and Newbur We wish to recruit a Cobol Programmer to join a new team developing Batch

and On-line systems for commercial and manufacturing applications. Configuration ICL 2904-40K, MTS, EDS 30s, FEDS and VIDEOS. Applications are invited from persons of either sex up to the age of 30 years.

Experience requirements — one to two years' COBOL programming. On-line experience an advantage.

An attractive salary will be offered and benefits include 4 weeks' annual

holidays and a pension scheme. Subsidised canteen facilities are available if

For an application form, please telephone our Personnel Manager, Mr. J. W. Heading, on Woolhampton 3221, or write to him at Starling Cable Company Limited, Beth Road, Aldermaston, Reading RG7 50D.

STANTA WE WIT





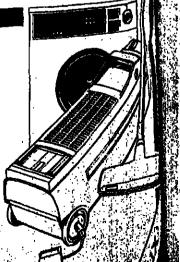
At ELECTROLUX, we know that an on-going capital investment programme and a winning product range go hand in hand. You'll see that by entering any one of the streamlined production areas where our superb domestic appliances take shape.

The next step is the replacement of our ICL 1904S with a new machine to cope with the ever increasing demands on our DP installation which also provides services for several associated companies

We therefore need Systems Analysts to work on interesting new systems and software projects, like the development of on-line systems, as well as a wide range of established commercial and financial applications.

You should have at least three years' experience in systems analysis including a positive contribution design and implementation of a substantial project in an environment similar to ours. Electrolux can offer very attractive starting selaries and many other large company benefits including generous staff discounts on company and associated company products and relocation assistance, when appropriate.

Male and female applicants should contact lan Molernon, Riccirchia Linguis S255.



E 8-9K | U.K.| 516-12/20 London — Rome Canadali London — Rome Canadali

to be an android like himself, for he was bedecked with pieces of electronics. Quartz crystals, calculators, modulators, de-modulators and assorted chips hung from his clothing like jewellery. On second thoughts he decided that all this was mere adornment. McNull was probably a human who had failed the cybernation course but collected

Block 21 (A Stumbling Block)
Disorientated by Simula's surprise telecommunication, Hex has done a bunk, leaving his friends in Sprocket's Hole. He is making for Fort Ranfour via Silicon Valley. There he pauses near his father's grave to ruminate on the benefits of forgetting.

LULLED by his hymn to forgetfulness, it had almost slipped Hex's memory that he was in hostile territory. He

remembered suddenly when a shrill voice piped up right behind his ear.

Hex almost leapt out of his shoes. Not two metres away

was a diminutive elf-like personage of indeterminate age. He was rotund in shape with wispy orange hair and a small

"Welcome O Son of Synapse," intoned the strange little man. "I am the humble goatherd, Johnny McNull. I wish to become one of thy disciples, even though I am unworthy to

reboot thy bootstraps."

Hex stood transfixed. At first he had taken the stranger

Behold! It is as it was foretold!"

pointed beard.

electronic curios like a jackdaw.

"I have no disciples," he asserted. He could see at a glance that the man was mad, but he didn't seem dangerous.

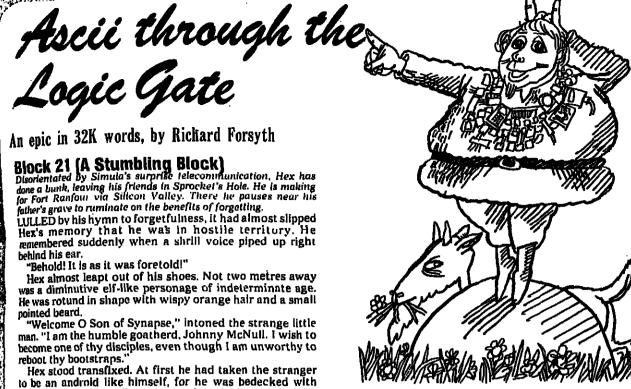
McNull began a reverential monologue. "Was it not

prophesied in the sacred scroll-mode texts that there would be wailing and gnashing of teeth among the people, and that they would groan exceedingly under the yoke of the Children of the Brain? Verily, it has come to pass. And was it not also fore-ordained in the earliest records that there should be revealed, even unto a lowly goatherd in the Valley of Sand, a goat with sixteen fingers to be a sign that the end of the System was at hand? Now mine eyes have

"Sixteen fingers," replied Hex guardedly. "I only have

"Thou art blind to the signification of thine own name. Art thou not the Kid that is called Hexadecimal?"

"Then understand that thou art indeed the goat of



prophecy and that the sixteen fingers are the sixteen digits of the hexadecimal scale — including of course zero, which

Hex saw now that this madness was dangerous after all. He backed away.

"Lead us, O Master Program, we beseech thee, out of the Domain of Negative Irrationals through the Ordered Field into the Promised Range. For truly thou art the Transformation Function."

"There is no Promised Range."

McNull looked crestfallen. Hex pressed home his advantage with an oratorical flourish: "Verily I say unto you, the Promised Range is the Empty Set. It is a figment of your

McNull's eyes shone once again. He knelt down. "Such ineffable wisdom," he murmured reverently, "an imaginary At this point Hex bolted. He just kept running—out of the

reservation and beyond, north towards San Jose. When he finally eased up, he was sure he had left his would-be disciple adrift far behind. The sun was sinking, but he decided to press on. There was no time to lose if he meant to beat Ascil to Fort Ranfour.

He rounded a corner and stopped dead in his tracks. A

motorcycle was parked across the narrow way. On it, holding a terminator in either hand, was the ubiquitous

"I've been doing some research," were his opening

Hex was speechless.

"There's a lot of information about you in the Database, if you know where to look. Apply a little common sense to it and your movements become rather predictable. I'm no APL guru, but I managed to knock up a few one-liners in an afternoon which gave your estimated time of arrival to the nearest minute — while the committee of savants up in Fort Runfour is still haggling over data declarations."

"Good work," bluffed Hex. "I'm glad your disenchant-ment with brute computing power has brought you over to our side. We need beings of your calibre." He was playing

"Ha, that's good!" replied Hock. "I'm not averse to flattery, but you'll have to raise the stakes a little to save your skin. There's a reward of 10 million Resource Units on your head. I could do an awful lot of text processing with those." He spun his firearms casually like a cowboy in a

Suddenly McNull clattered into view, riding a sledge drawn by four goats. It was piled high with tubs of goat's cheese, milk and other delicacies, and had the words "McNull's Farm-Fresh Dairy Products" emblazoned on the side. Before Hock could react, he began pelting him

with ripe yogurt. Hex seized his chance. He grabbed Hock's crash-helmet and wrenched it the wrong way round. Hock lashed out blindly. A wild flash of radiation from his terminator struck the fuel tank on his machine and ignited the petrol. As he staggered back from the heat, Hex and McNull pinned him to the ground and disarmed him.

"Thanks," said Hex. "I guess I could use a disciple after

"All part of the service," replied McNull blandly.
"Hey? What happened to the biblical idiom? I was getting

"You mean the speech impediment. I got that through trying to follow the instructions in Do-It-Yourself Cybernation Magazine. All voltage levels on the neural interface are meant to be +5 or earth; but mine weren't. I burnt out a chunk of my nervous system, I'm afraid. Ever since, when the feeling comes over me, I talk that way. I can't help it. You'll find I have other endearing quirks too."
"What about the Promised Range and all that?"

"Just as you say; it doesn't exist

"Too bad," said Hex, regretfully.

They handcuffed Hock with his own cycle-clips and set of for San Jose on McNull's ramshackle chariot, leaving the bounty-hunter stranded in their wake.

Do you know the way to San Jose? It's going to be a

11 1978 Richard Forsyth, Bull Timesharin

BOROUGH TREASURER'S

The Council's present computer installation, a Honeywell 125 Disk and Magnetic Tapes, is to be replaced in mid-1978 with Honeywell Level 64/20 Disks and Magnetic Tapes in conjunction therewith the Council propose to expand their present team of Systems Analysis and Programmers

SYSTEMS AND PROGRAMMING MANAGER - POST T90/2

GRADE P01 (3-7) (£6060-£6702 per annum

This is a new post. The person appointed will supervise the Systems Analysis and Programming team and be responsible for the design, specification, testing and maintenance of both on-line and batch systems. The ability to haise with user slaff at all levels is essential. Applicants should also have at least 6 years experience at senior management level in developing computer applications.

COMPUTER PROGRAMMER - POST

GRADE AP 3/4 (£3732-£4632)

Work includes development of new applications of both on-line and batch systems, and maintenance of existing programs. Applicants must have at least 2 years relevant experience and be competent in the use of COBOL. The commencing salary will be determined having regard to experience. 100% removal expenses. Up to £500 payable towards legal and estate agent's fees plus generous disturbance and separation allowances. Flexible working hours.

Temporary housing accommodation may also be available. For application forms and further details write to the Personnel and Managament Services Officer, Box No. 16, Fareham Borough Council, Civic Way, Fareham, Hents, PO16 7PP, (Tel. Fareham 236100 Ext. 232,)

Closing date for receipt of applications 5th December, 1978.

Fareham → Borough Council

IBM 370/ 135 Ops. EDUCATION DEPARTMENT RICHMOND UPON THAMES COLLEGE

Part-time (Day) Lecturer in **Computer Studies**

Required immediately for up to house per week Place interpolar ? S. Sheedy, 01-832 8558, sat. 1. Richmond upon Themes College, So. ton Road, Iwickenhern TW2 75.

job set-up controller

We are looking for a Job Set-Up Controller to be responsible for supervising a team of Job Assemblers in preparing schedules and assembling jobs for the Operations Department.

This company is a major user, with an installation centred round a one megabyte (words) quadruple H66/80, with extensive online and batch applications. Substantial Hardware enhancements are planned for the near future. The ideal candidate will be an experienced

operations specialist aged 23 - 30 who possesses a broad knowledge of operating systems (with particular reference to JCL) and significant practical experience as a Shift Leader or Job Assembler.

We can offer an excellent salary, good working conditions and first-rate prospects in a rapidlygrowing installation. If interested, please write with brief details of age, experience and education, to :- Alan Picton, (Ref.92/1611/CW), Appointments Manager, Littlewoods, JM Centre, Old Hall Street, Liverpool X L70 1AB.

Littlewoods

TALAR

TOURIST AIRLINES OF PAPUA NEW GUINEA

AN EXPERIENCED ICL RPG2 PROGRAMMER (COBOL helpful)

WE HAVE ICL 2903 With ED860

YOU GET

Exceptionally good package for the right person. terviews held in London week commending 19th

Apply with full detells to Mr. Goold Box No. 1996

Senior Programmer Gloucestershire

Ronk Xerox Manufacturing Group have their main U K factory located at Mitcheldean in Gloucestershire. Here in attractive rural surroundings an extensive modern site employs over 3500 people on the Design, Manufacture and Distribution of some of the company's most advanced business machines.

We have an opportunity for a Senior Programmer to join a team committed to a wide range of systems (based on an IBM 370) in a challenging and stimulating environment whore there are excellent prospects for career developm The successful candidate will be a majure professional with a minimum of 4 years

IBM COBOL, including 2 years under OS and experience of large main frame systems using data base techniques. A good knowledge of UNIPAY and financial applications and a knowledge of Assembler will be additional advantages The successful carididate will be offered an attractive salary, excellent conditions of

employment including pension scheme, free life assurance and (where appropriate)

Apply giving details of your qualifications, career to date and current salary to Mr. N. C. Abraham, Personnel Department, Rank Xerox Ltd.,

RANK XEROX

MANUFACTURING GROUP

CLASSIFIED COPY All classified copy should reach our offices no

later than 5.30 p.m. on the Monday preceding Thursday's publication, if complete artwork is supplied 12 noon on a Tuesday.

Ring lan Carter for further details on 01-261